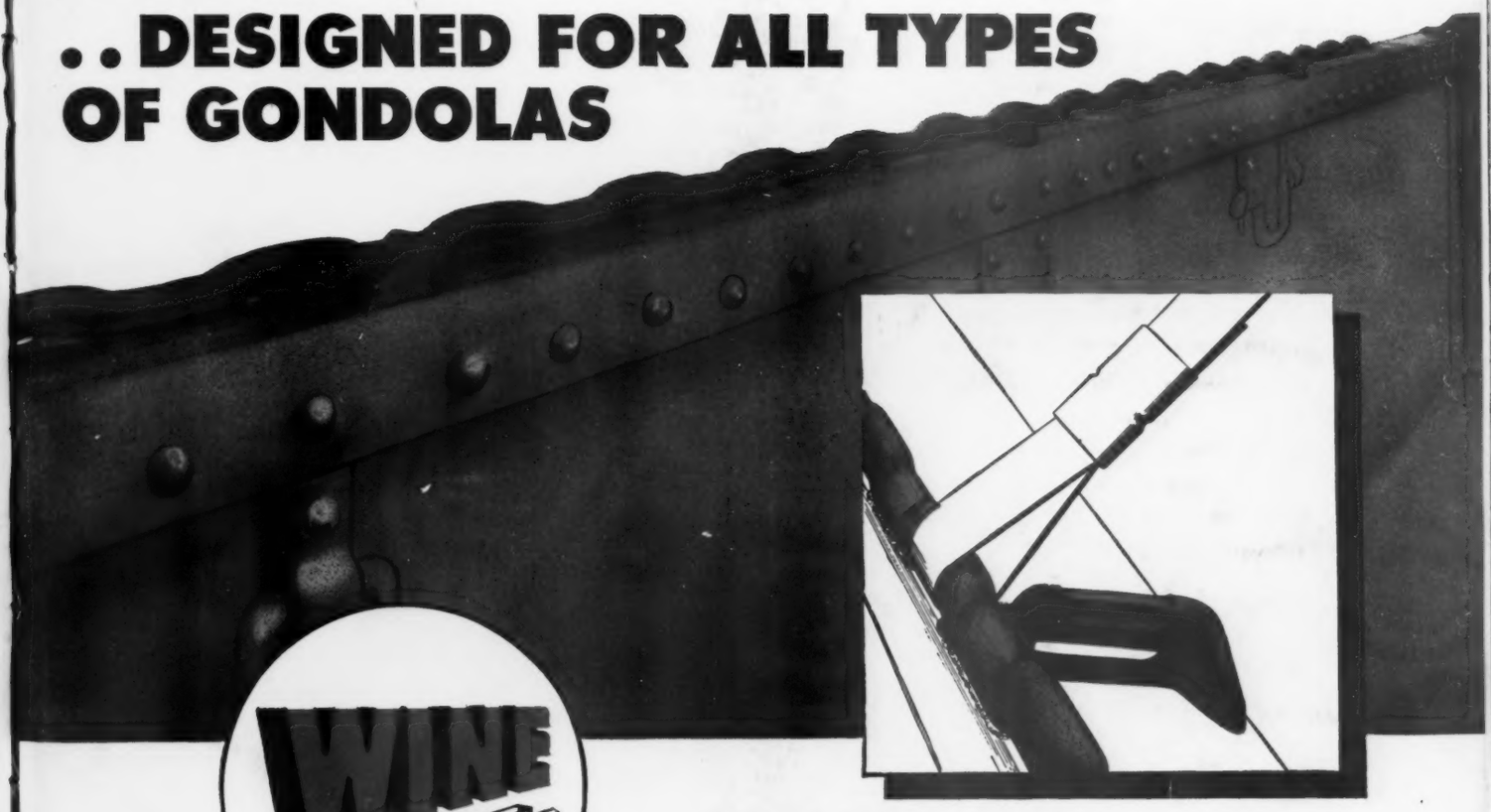
FOUNDED IN 1832

AUGUST, 1951

RAILWAY Mechanical and Electrical Engineer

PROVIDES MULTIPLE STRAP LOCATIONS!

..DESIGNED FOR ALL TYPES OF GONDOLAS



WINE

CONTINUOUS

LADING BAND ANCHOR

and

REINFORCEMENT

(PATENT PENDING)

- ACCOMMODATES BANDS OR WIRES
- NO SHARP CORNERS
- OVER ANCHORAGE

THE WINE RAILWAY APPLIANCE CO. TOLEDO 9, OHIO


MEMBERSHIP ROLL
UNIT TRUCK "1000" - CLUB
OVER 10,000 CAR SETS
ATLANTIC COAST LINE
BURLINGTON
GENERAL AMERICAN TRANS. CORP.
LOUISVILLE & NASHVILLE
MISSOURI PACIFIC
NEW YORK CENTRAL
PENNSYLVANIA
UNION TANK CAR CO.
5 - 10,000 CAR SETS
CHESAPEAKE & OHIO
CHICAGO & NORTHWESTERN
ERIE
GULF MOBILE & OHIO
NORFOLK & WESTERN
ROCK ISLAND
3 - 5,000 CAR SETS
*BALTIMORE & OHIO
DELAWARE & HUDSON
GREAT NORTHERN
LACKAWANNA
NORTHERN PACIFIC
PITTSBURGH & LAKE ERIE
SEABOARD AIR LINE
2 - 3,000 CAR SETS
AMERICAN REFRIGERATOR TRANSIT
ARMOUR CAR LINES
CENTRAL OF GEORGIA
FRUIT GROWERS EXPRESS
ILLINOIS CENTRAL
LEHIGH VALLEY
NASHV. CHATTANOOGA & ST. LOUIS
VIRGINIAN
1 - 2,000 CAR SETS
CANADIAN PACIFIC
*CHICAGO & EASTERN ILLINOIS
CHI. ST. PAUL, MINNEAPOLIS & OMAHA
DENVER & RIO GRANDE WESTERN
DETROIT, TOLEDO & IRONTON
*ELGIN, JOLIET & EASTERN
NEW HAVEN
*SOO LINE
SOUTHERN PACIFIC
*SPOKANE, PORTLAND & SEATTLE
*UNION PACIFIC
*WABASH
*WARREN MARITIME CORP.
*WESTERN FRUIT EXPRESS
*NEW MEMBER
NEW MEMBERS SINCE JAN. 1, 1951
NATIONAL RAILWAYS OF MEXICO
BANGOR & AROOSTOOK RAILROAD
UNITED STATES ARMY
BUFFALO CREEK RAILROAD
Yes! - It's the World's fastest growing Railroad Club

Published monthly by Simmons-Boardman Publishing Corporation, 1309 Noble Street, Philadelphia, Pa. Entered as second-class matter, April 19, 1949, at the Post Office at Philadelphia, Pa. under the Act of March 3, 1879. Subscription price, $3.00 for one year U. S. and Canada. Single copies, 50 cents. Vol. 125, No. 8.

EASY TO ROLL OUT...

This 25-cell, 850-amp-hr air-conditioning battery, weighing about 2580 pounds, is easier to pull out for inspection than a 5-cell tray in any ordinary installation.

That's because

The Wheels Do the Work

Battery inspection can be SIMPLE!

WITH POWER demands on railroad batteries becoming greater, and with turn-around time for passenger trains becoming shorter, there's a growing need for quicker, yet more *positive*, battery servicing during layovers.

It was to meet this situation that engineers of the Edison Storage Battery Division developed the Edison roll-out battery cradle. It's a simple device —a sturdy steel cradle fitted with husky ball-bearing wheels, which can be rolled out along extension tracks. It makes every cell completely accessible for swift, sure servicing.

Don't overlook this new way to cut maintenance costs. Let us assist you in adapting roll-out cradles to existing or proposed compartments. Complete information and typical layouts furnished on request.

During the past three years, the roll-out;cradle has been field tested and adopted by several of the nation's top railroads, and the following additional advantages have been established:

Cleaner batteries: dirt quickly blown out during servicing.

Shorter jumpers: reduced cable footage, less voltage drop.

Quicker shopping: entire cradle removable by crane or fork truck.

Better ventilation: battery suspended above compartment floor.

No conflicts: roll-out compartment also takes regular assemblies.

No greater space: will accept largest battery now in standard compartment.

EDISON
Nickel · Iron · Alkaline
STORAGE BATTERIES

EDISON STORAGE BATTERY DIVISION OF THOMAS A. EDISON, INCORPORATED, WEST ORANGE, NEW JERSEY

SCRAP IS

SCARCE

AGAIN demands of defense production place a heavy burden on America's rail transportation. Scores of thousands of new freight cars must be put into service quickly. Present equipment must be kept rolling for more pay hours with minimum time lost in paint shops.

● **Pittsburgh's** famous CARHIDE is contributing vitally to this speed-up of the freight car program.

● **With CARHIDE,** rolling stock can be painted with primer, two coats and stencilling within twenty-four hours. In addition its remarkable ease of application, thorough hiding and quick-drying qualities, CARHIDE provides a glass-smooth, extra durable surface that protects equipment for many thousands of miles even under the most severe operating conditions. It resists cracking and peeling often caused by temperature extremes and withstands repeated washing and scrubbing.

● **Besides the standard high quality** coating, enriched with special *"Vitolized Oils,"* which has been used with such success by many of the country's leading systems, CARHIDE is available in quick-drying synthetic and alkali- and acid-resisting types.

● **Call on us** for advisory suggestions. You'll find that our long-time experience in this field as well as our far-flung facilities often can save you time and money.

PITTSBURGH PLATE GLASS COMPANY
Industrial Paint Division, Pittsburgh, Pa.
Factories: Milwaukee, Wis.; Newark, N. J.; Springdale, Pa.; Houston, Texas; Los Angeles, Calif.; Portland, Ore. Ditzler Color Div., Detroit, Mich. The Thresher Paint & Varnish Co., Dayton, Ohio. Forbes Finishes Div., Cleveland, Ohio. M. B. Suydam Div., Pittsburgh, Pa.

Pittsburgh Railway Finishes For Every Need

CARHIDE—for wood and metal freight cars of all types.

LAVAX SYNTHETIC ENAMELS—for locomotive and passenger cars.

STATIONHIDE—adds beauty and comfort to stations.

IRONHIDE—for iron and steel fixed properties.

SNOLITE—white fume-proof paint for signs, crossing gates, fences and cattle guards.

PITTSBURGH PAINTS

PAINTS • GLASS • CHEMICALS • BRUSHES • PLASTICS

PITTSBURGH PLATE GLASS COMPANY

RUGGED DEPENDABILITY FOR TOUGHEST DUTY ON ANY 'ROAD

QUAKER HOSE

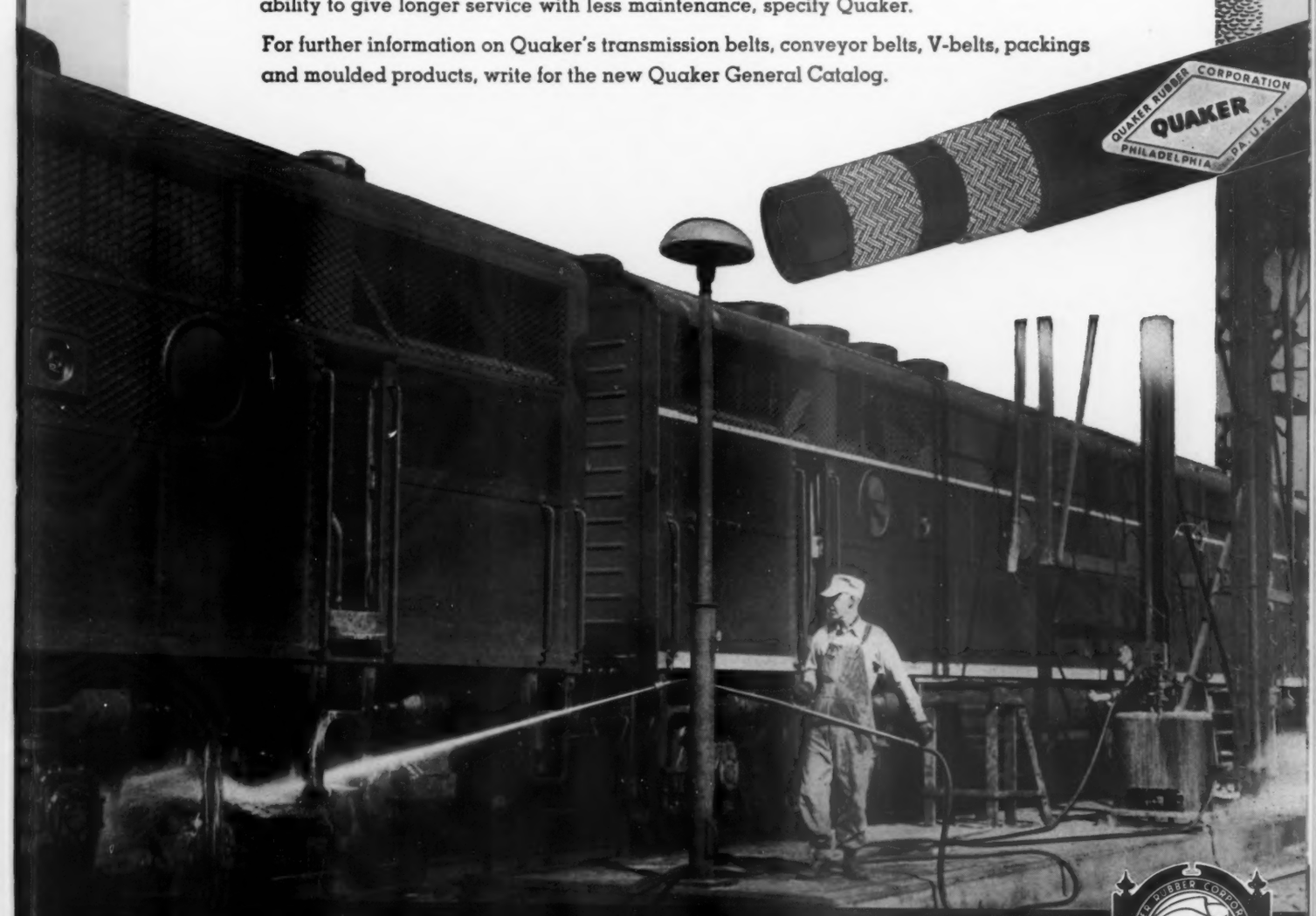
FOR AIR... WATER... STEAM... CHEMICALS

Quaker Hose takes the worst and gives the best in the toughest types of railroad service. It withstands heat, weather, abrasion and strain.

That's why leading railroads throughout the nation specify Quaker Hose where the going is tough and the duty severe. Quaker Hose is made with the finest cotton yarn, scientifically constructed in strong, resilient rubber. Result . . . extreme flexibility, with outstanding resistance to crushing and wear.

There's a Quaker Rubber Hose for every requirement of the railway industry. In the "yard," or on rolling stock, whenever you need hose or any rubber product with proved ability to give longer service with less maintenance, specify Quaker.

For further information on Quaker's transmission belts, conveyor belts, V-belts, packings and moulded products, write for the new Quaker General Catalog.

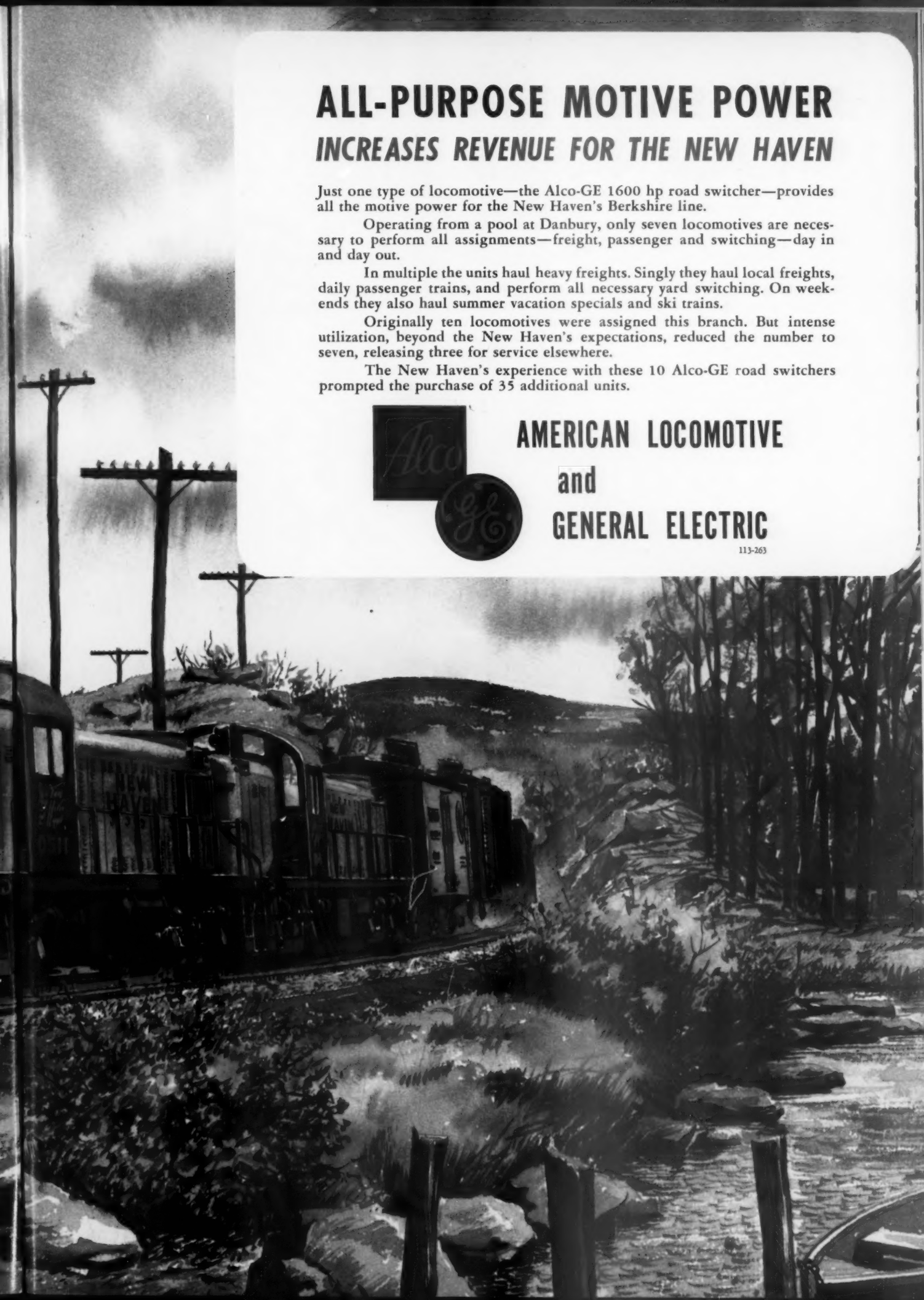


QUAKER RUBBER CORPORATION

DIVISION OF H. K. PORTER COMPANY, INC.

PHILADELPHIA 24, PENNA. BRANCHES IN PRINCIPAL CITIES


0501
NEW
HAVEN



ALL-PURPOSE MOTIVE POWER

INCREASES REVENUE FOR THE NEW HAVEN

Just one type of locomotive—the Alco-GE 1600 hp road switcher—provides all the motive power for the New Haven's Berkshire line.

Operating from a pool at Danbury, only seven locomotives are necessary to perform all assignments—freight, passenger and switching—day in and day out.

In multiple the units haul heavy freights. Singly they haul local freights, daily passenger trains, and perform all necessary yard switching. On weekends they also haul summer vacation specials and ski trains.

Originally ten locomotives were assigned this branch. But intense utilization, beyond the New Haven's expectations, reduced the number to seven, releasing three for service elsewhere.

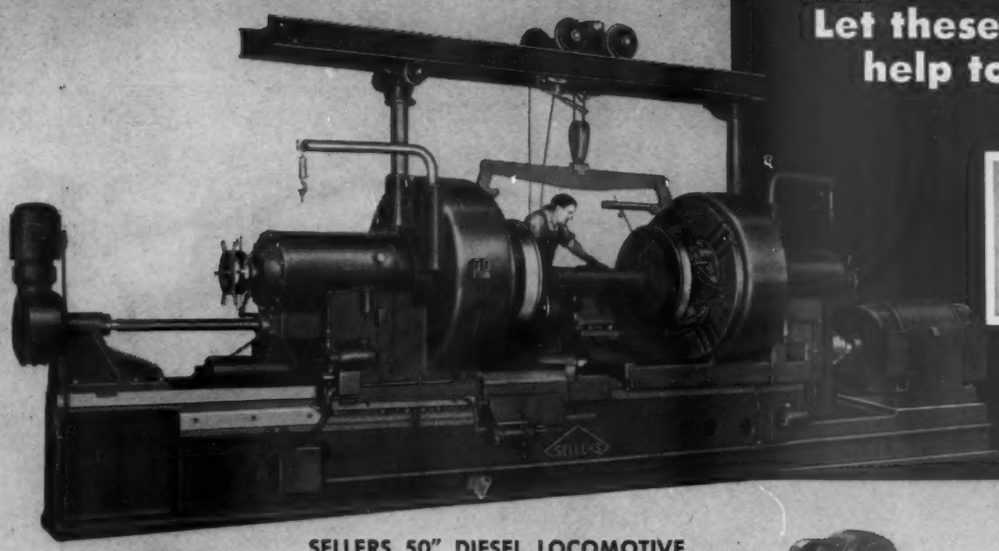
The New Haven's experience with these 10 Alco-GE road switchers prompted the purchase of 35 additional units.

AMERICAN LOCOMOTIVE
and
GENERAL ELECTRIC

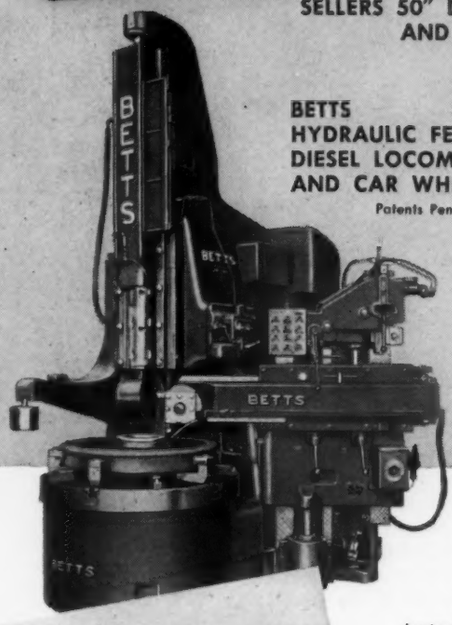
113-263

Let these modern machines help to reduce your costs

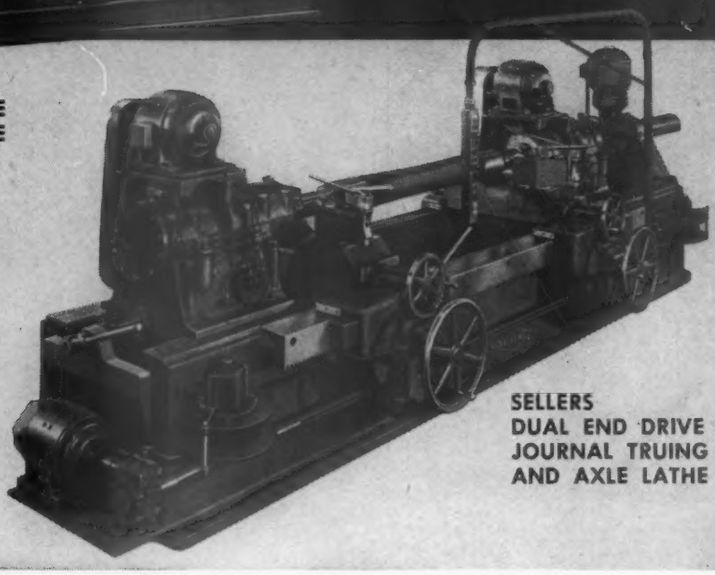
Faster, more economical production for all your diesel locomotive and car wheel and axle work



SELLERS 50" DIESEL LOCOMOTIVE AND CAR WHEEL LATHE



BETTS
HYDRAULIC FEED
DIESEL LOCOMOTIVE
AND CAR WHEEL BORER
Patents Pending



SELLERS
DUAL END DRIVE
JOURNAL TRUING
AND AXLE LATHE

Among Railroad Tools built by Consolidated are . . .

CAR WHEEL BORERS
DIESEL WHEEL BORERS
BURNISHING LATHES
TIRE MILLS
END DRIVE AXLE LATHES
CENTER DRIVE AXLE LATHES
JOURNAL TRUING LATHES
DRIVING WHEEL LATHES
CAR WHEEL LATHES
RADIUS LINK GRINDERS
PROFILE MILLING MACHINES
SLAB MILLING MACHINES
ROD MILLING MACHINES
CYLINDER BORING MACHINES
KEYWAY MILLING MACHINES
CRANK PLANERS
DRILL PRESSES
AND OTHERS

SELLERS 50" DIESEL LOCOMOTIVE AND CAR WHEEL LATHE turns diesel locomotive and car wheels from 28" to 50" tread diameter. Designed with speed range suitable for either carbide or high speed steel tools. Two mechanical speed changes in conjunction with a variable speed 75 H.P. motor provide speed ranges of approximately .9 to 3.6 R.P.M. and 5 to 20 R.P.M. of faceplate with instantaneous speed selection. Faceplates are recessed, with removable filler blocks, for turning diesel wheels, motor coach wheels and trailer wheels with roller bearings. As illustrated, this machine is arranged with four self-equalizing hydraulic drivers on each faceplate, insuring equalized pressure on the wheel rims.

BETTS HYDRAULIC FEED DIESEL LOCOMOTIVE AND CAR WHEEL BORER takes diesel locomotive wheels up to 48" tread diameter, passenger and freight car wheels down to 30" tread diameter. Hydraulically operated side head, for turning and facing hubs, has feed and rapid traverse vertically and horizontally with supplementary hand feed. Full automatic boring cycle from loaded start to stop supplemented by manual operation at any point in the automatic cycle. Speed range suitable for either carbide or high speed steel tools.

SELLERS DUAL END DRIVE JOURNAL TRUING AND AXLE LATHE for both new and reconditioning work, this machine turns and burnishes rough turned AAR car axles in sizes from 4¼" x 8" up to and including 6½" x 12", and turns and burnishes journals and collars on mounted car wheel sets up to and including 38" tread diameter. It is also available with greater swing for larger wheels. Designed with speed range suitable for carbide tools.

Full details covering any or all of these modern Consolidated machines will be furnished upon request. Let us show you how their labor-saving features not only can help to reduce your costs but also, by largely eliminating manual operations, encourage the operator to make full use of the higher production capacities of which these machines are capable.

BUILDERS OF HEAVY DUTY MACHINE TOOLS SINCE 1848

BETTS • BETTS-BRIDGEFORD • COLBURN • HILLES & JONES • MODERN • NEWTON • SELLERS

CONSOLIDATED MACHINE TOOLS

CONSOLIDATED
MACHINE TOOL CORPORATION

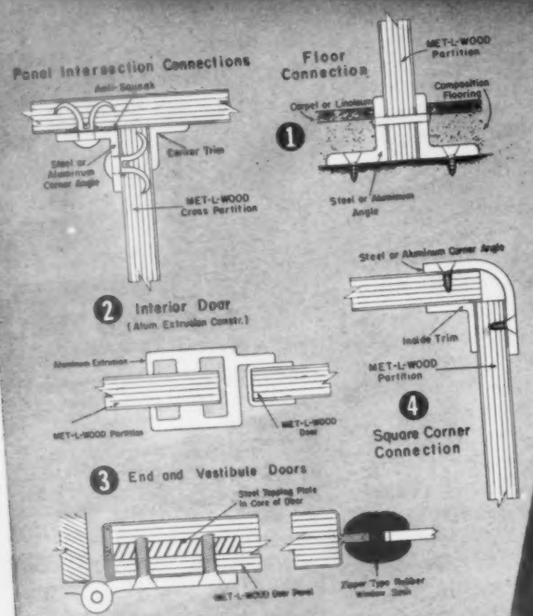
ROCHESTER 10, NEW YORK

MET-L-WOOD
METAL BONDED TO PLYWOOD

VERSATILITY
FOR MODERN CAR INTERIORS

Met-L-Wood walls provide a smooth, luxurious finish in addition to saving weight and simplifying construction.

MET-L-WOOD passenger car partitions, doors and paneling not only produce beautiful finished surfaces, but can also save up to 73%* in weight and a substantial amount of construction time. Shown at left, and described below are typical Met-L-Wood construction details. Full information on Met-L-Wood versatility in new or rebuilt cars will be furnished promptly on request. Write today.



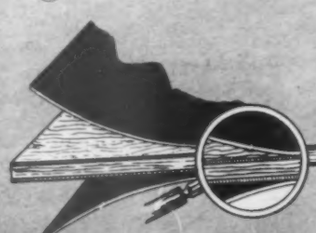
❶ Panel intersections with Met-L-Wood can be made invisible from outside with the use of split rivets. Floor connections may be made in a variety of ways, one of which is shown here, using through-rivets and metal screws.

❷ Interior doors of Met-L-Wood can be fitted with aluminum extrusion door stops; or the Met-L-Wood partition formed so that the door stop is an integral part of the panel.

❸ Steel tapping plate inserts can be put in Met-L-Wood doors at proper places for solidly anchoring hinges and door-opening devices. Note simplicity of using zipper-type window sash with pre-formed Met-L-Wood window openings.

❹ Square or rounded corners are made with Met-L-Wood panels and steel or aluminum corner forms. Corner forms can also be fastened with split rivets or through-rivets, as well as with wood or metal screws.

**Met-L-Wood panels 3/8" thick, with steel both sides, have a stiffness factor exceeding that of 1/4" solid steel plate, while weighing only 27% as much as steel!*



MET-L-WOOD CORPORATION

6755 West 65th Street, Chicago 38, Illinois

MET-L-WOOD • *STRONG... LIGHT... Smooth Finish... Sound Deadening... Fire-Resisting... Insulating*

UNION OIL COMPANY
cuts cylinder wear, lengthens service of equipment with...

...KOPPERS *K-Spun* Porous Chrome* PISTON RINGS

Union Oil Company's newly modernized Avila (California) Terminal utilizes three 460 h.p. Enterprise dual-fuel engines with single-stage Ingersoll-Rand SHV centrifugal pumps. Engines are 6 cylinder, 12" bore, 15" stroke, 4 cycle, 450 rpm, non-supercharged. Each piston is fitted with two Porous Chrome, three tapered and two oilcutter Koppers Piston Rings.

Koppers K-Spun Piston Rings, produced by an exclusive centrifugal casting process, are 100% stronger and four times more resistant to combustion shock than ordinary cast iron rings, and will not break in installation or in service.

Koppers Porous Chrome Rings have a porous chrome surface that holds and distributes oil during break-in, quickly wears down to perfectly seated solid chrome that prevents grit and other particles from embedding in the ring surface where they can scratch cylinder walls. Porous Chrome Rings last up to four times as long as other rings, reduce cylinder wear 50% or more.

That's why hundreds of companies like Union Oil are reporting amazing savings in equipment and maintenance costs through the use of Koppers Rings. Remember . . . we make rings for *anything* that uses piston rings.

If you have a piston ring problem, why not get the *right* answer from us? Write, wire or phone KOPPERS CO., INC., *Piston Ring Dept.*, 1578 Hamburg St., Baltimore 3, Maryland.

KOPPERS

KOPPERS
AMERICAN HAMMERED
PISTON RINGS

*VAN DER HORST PROCESS

ONLY KOPPERS CAN FURNISH K-SPUN OR POROUS CHROME!

For *lasting* insulation strength, Sperry counts on HARVEL 912-C

For more than 10 years, Sperry Gyroscope Company has been insulating coils and other components with Harvel Internal Curing Varnishes, because of their excellent mechanical and electrical properties. Sperry . . . world famous for the quality and performance of its instruments . . . reports these specific advantages from the use of Harvel 912-C, electrical insulating varnish:

1. *High mechanical strength.* Conductors rigidly bonded into a compact mass. No soft, tacky varnish interiors to allow movement of conductors.
2. *High dielectric strength* . . . 2200 vpm. Electrical properties retained at high temperatures—unaffected by oil.
3. *Fast baking time.* 912-C cuts baking schedules as much as 50%—materially reduces production costs.

Sperry also turns to Irvington for Class "H" flexible insulations when space and weight are at a premium. Running safely at temperatures as high as 500°F, these insulations permit using smaller conductors, and thus open the way to lighter, more compact designs. It will pay *you* to investigate these Irvington products—mail coupon today for the full story.

Send this convenient coupon now

Irvington

VARNISH & INSULATOR COMPANY

Irvington 11, New Jersey

Irvington Varnish & Insulator Co.
6H Argyle Terrace, Irvington 11, N. J. RM-8/51

Gentlemen:

Please send me technical literature on:

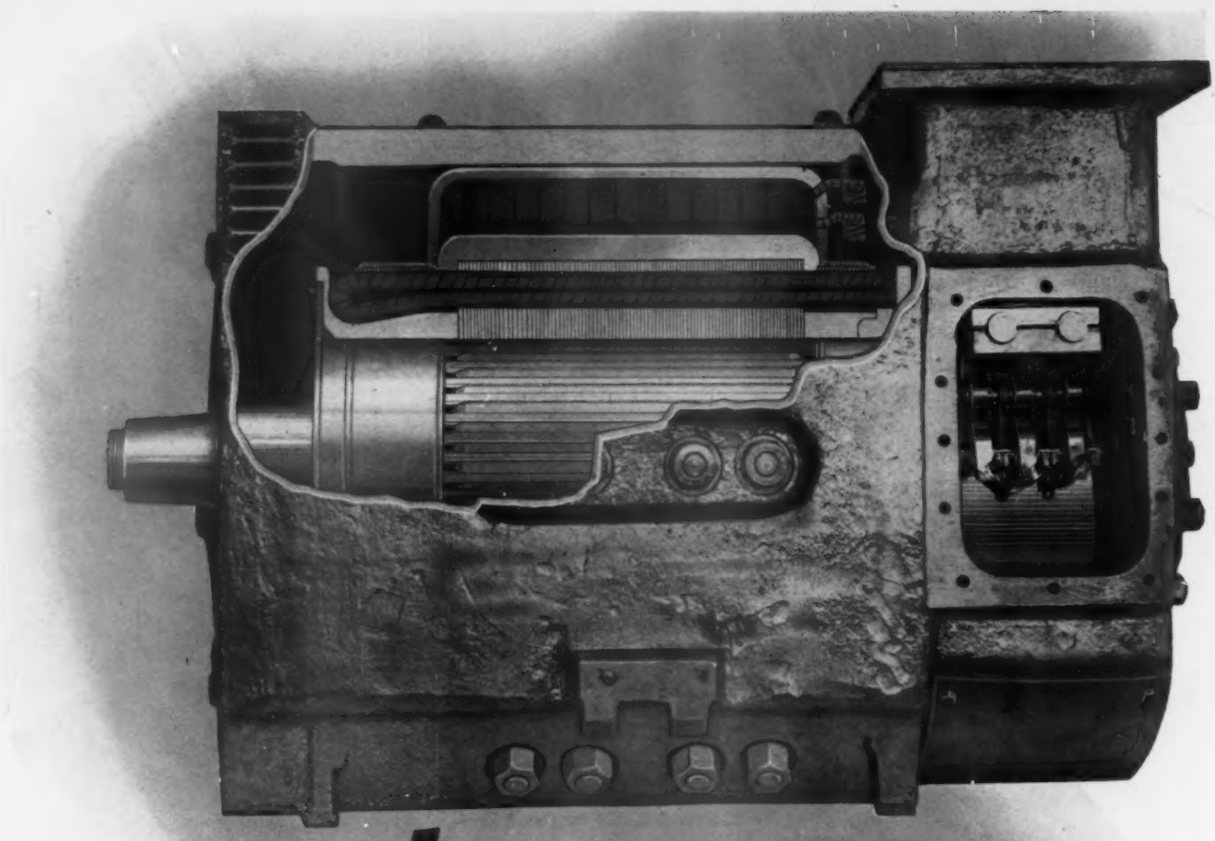
☐ Harvel 912-C Varnish ☐ Class "H" Insulation

Name.....

Company.....

Street.....

City.....Zone.....State.....



Rugged Coils

for diesel-electric motors and generators

National coils for railroad service are not "standard" coils; they embody the extra mechanical strength, high temperature endurance and extra water and oil resistance which unpampered railroad use needs.

Proof? Try them; your own mileage-overhaul records will tell a convincing story. Or ask a user. Many of America's leading railroads use National coils and insulation exclusively in their shops. Others send part or all of their rewinding and mileage inspection overhaul work to our Columbus plant.

However you handle such work, our facilities will fit into your program perfectly. Write or wire us now; our nearby field engineer will contact you quickly.

A National field coil—which will remain tight in the frame because it is pre-seasoned, efficiently dissipates heat and withstands high temperature.

A National armature coil — hotpressed; mica and glass insulated; for especially long, especially dependable service.

NATIONAL ELECTRIC COIL COMPANY

COLUMBUS 16, OHIO, U. S. A.

ELECTRICAL ENGINEERS: MAKERS OF ELECTRICAL COILS AND INSULATION—REDESIGNING AND REPAIRING OF ROTATING ELECTRICAL MACHINES

Preliminary Performance Data*

FAIRBANKS-MORSE

1600 hp. Road Transfer Locomotives

owned by the

Southern Railway System

---

*Figures must be kept confidential, of course.
But - they show that these Fairbanks-Morse Locomotives are setting new standards on the Southern - for time in use, tonnages handled, and miles per day - in local service on the Western Lines.

...for operation photos - see inside!

SM 3-50

Form 1008

SOUTHERN RAILWAY SYSTEM

MONTHLY STATEMENT OF LOCOMOTIVE MILES

Western Division, Month of June 19 51

CORRECT

SUPERINTENDENT

Locomotive Numbers	Total Locomotive Miles	Locomotive Numbers	Total Locomotive Miles	Locomotive Numbers	Total Locomotive Miles	Locomotive	Total Locomotive Miles
6545							
6546							
6547							
6548							
6549							
6550							

On daily freight run No. 6547 stops at Buechel to drop a car ...

THE SOUTHERN SR SERVES THE SOUTH

... then hits the road at a fast clip for local stops east of Louisville. Nighttime finds six of these 1600 hp. Fairbanks-Morse locomotives kept busy moving local and through freight on a turn-around basis.

SM 3-50

Form 1008

SOUTHERN RAILWAY SYSTEM

MONTHLY STATEMENT OF LOCOMOTIVE MILES

Western Division, Month of July 19 57

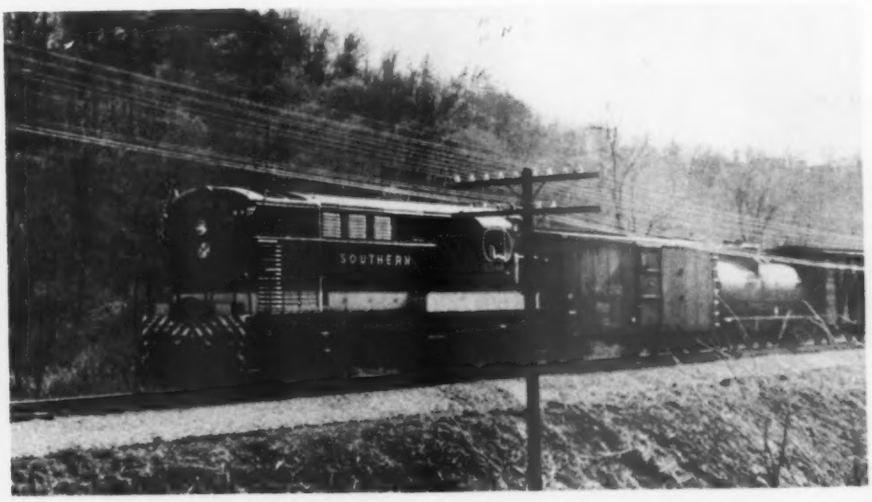
CORRECT

SUPERINTENDENT

Locomotive Numbers	Total Locomotive Miles	Locomotive Numbers	Total Locomotive Miles	Locomotive Numbers	Total Locomotive Miles	Locomotive Numbers	Total Locomotive Miles
6545							
6546							
6547							
6548							
6549							
6550							

Across the river on the hilly North Shore No. 6546 is handling local switching and transfer operations...

THE SOUTHERN SR SERVES THE SOUTH



... While No. 6548 heads for home down the hill from Milltown tunnel. Often, three of these units combine to haul 3600 tons up steep Duncan Hill. As two-unit 3200 hp. locomotives they pull 2400 tons. "Operating perfectly," say the local Southern mechanical and operating personnel.

Fairbanks, Morse & Co.

600 SOUTH MICHIGAN AVENUE

CHICAGO 5

The Southern's first diesel locomotive was delivered in August, 1939.

It was powered by the then "new" Opposed-Piston engine.

Testifying to the basic "rightness" of the Opposed-Piston design is the fact that these original Opposed-Piston powered locomotives are still in service.

Constantly improved through the years, Opposed-Piston engines totaling over 5,000,000 hp. have been built by Fairbanks-Morse.

Opposed-Piston diesel-powered Fairbanks-Morse locomotives are identified with many "firsts" in railroading performance.

As they are contributing here to the Southern Railway's efficient operation, so might they to yours.

FAIRBANKS, MORSE & CO., Chicago 5, Illinois

On-line display of the Southern Railway System's first diesel locomotive -- powered by an Opposed-Piston engine. August, 1939.

THE SOUTHERN SR SERVES THE SOUTH

FAIRBANKS-MORSE, a name worth remembering


Standardize..
on diesel-starting batteries with interchangeable
Exide-Ironclad BATTERIES

. . . and Save

by cutting down the number of batteries required as spares

Exide-Ironclad standardization is made possible by an all-purpose molded container assembly. Because of this construction, two types of Exide-Ironclads—both universally interchangeable—fully meet the battery needs of diesel-electric locomotives of practically every size and make. In addition to the economies this standardization provides, Exide-Ironclad Batteries give you:

QUICK BREAKAWAY and fast acceleration of engine to firing speed.

HIGH POWER RESERVE *at all times* for positive operation of control equipment.

HIGH AVAILABILITY—uninterrupted on-line service.

LOW RATES OF DEPRECIATION—exceptionally long life.

LOW COSTS of operation, upkeep, repair.

EASE OF MAINTENANCE—easy to add water and keep charged.

RUGGED CONSTRUCTION for hard, continuous use.

INHERENT SAFETY—freedom from hazards of fire or disruptive breakage.

These and other qualities combine to make Exide-Ironclad the best battery buy . . . at any price.

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia 2

Exide Batteries of Canada, Limited, Toronto

"Exide-Ironclad" *Reg. Trade-mark U. S. Pat. Off.*

1888 . . . DEPENDABLE BATTERIES FOR 63 YEARS . . . 1951

◀ Type MV-17-D Exide-Ironclad Battery—284 ampere hours—for cranking switching locomotives of 600 hp. and larger.

Type MV-25-D Exide-Ironclad Battery—426 ampere hours—for cranking road locomotives of the larger sizes. ▶

WHEN IT'S AN EXIDE-IRONCLAD YOUR DIESELS *START*

It's Easier with HYATTS

The basic design of Hyatt Roller Bearing Journal Boxes makes them easier to maintain. Straight radial construction permits easy, quick removal of journal boxes by hand, without special tools and without disturbing any press fits.

When wheels are dropped, Hyatt boxes can be slipped off, given a quick visual inspection, and immediately reapplied to another wheel-set equipped with Hyatt inner races and water guards.

Spare axles require Hyatt inner races only, instead of complete journal boxes. This permits a substantial reduction in spare parts inventory.

No special tools!

1. REMOVE

2. INSPECT

3. REAPPLY

We have prepared a simple plastic journal box visualizer to illustrate this point. Let us send you one free of charge. Hyatt Bearings Division, General Motors Corporation, Harrison, N. J.

HYATT ROLLER BEARING JOURNAL BOXES

90 minutes...

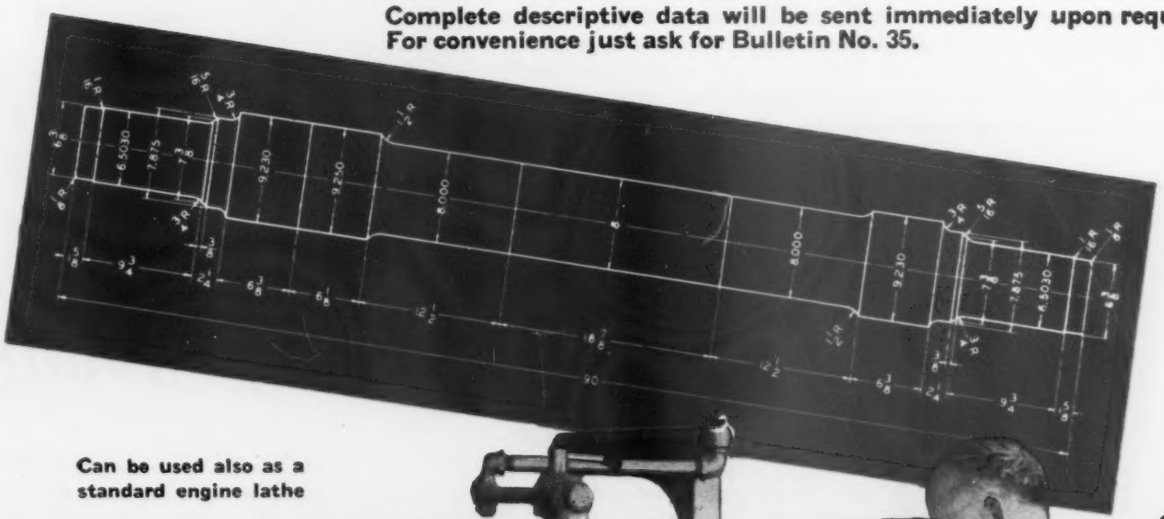
TO COMPLETELY FINISH TURN THIS LOCOMOTIVE AXLE!

It usually takes about 8 hours to do this job. A saving of 6½ hours to finish this axle is a real saving in any railroad shop.

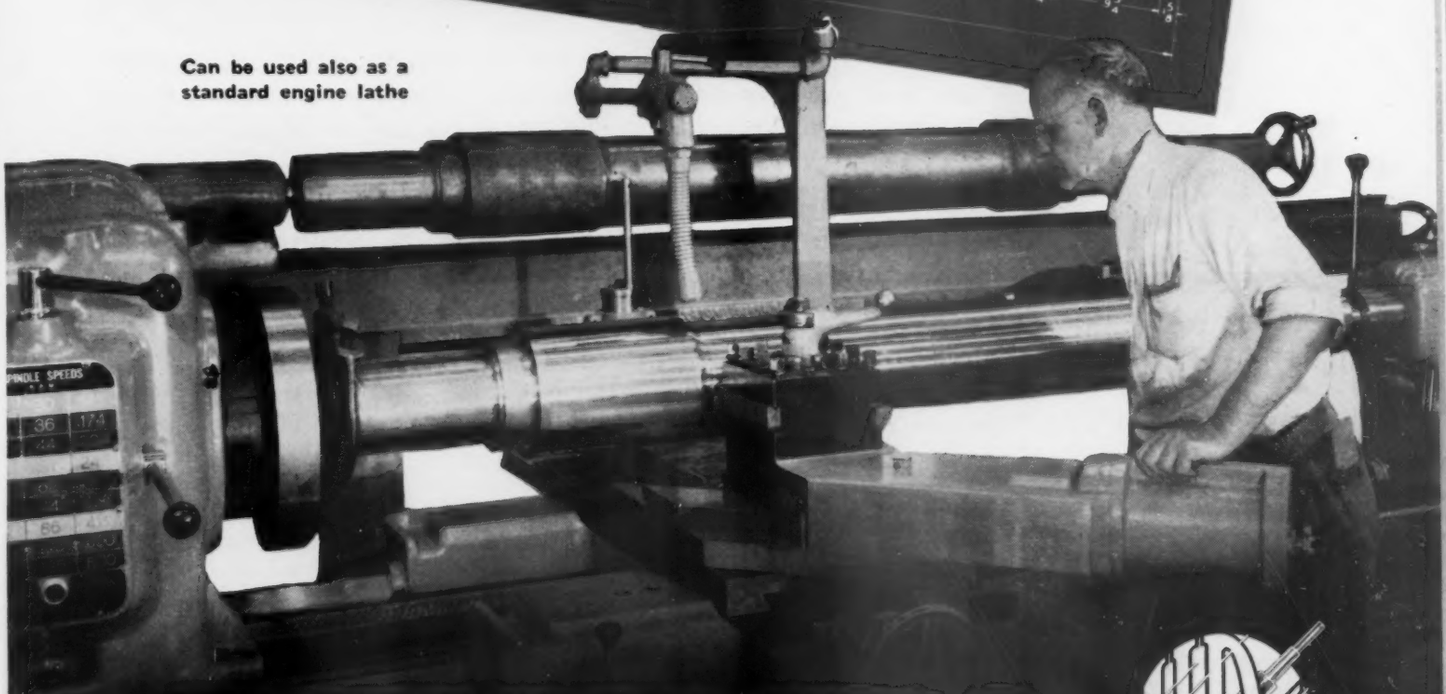
It proves conclusively that the new "American" Hydraulic Duplicating Lathe is a positive answer to lower costs in the railroad shops.

The new 25-inch "American" Hydraulic Duplicator on which this job was done has the enormous power, the unfaltering stamina and the ease of control which combine to make it the production marvel of the moment. Cost-minded executives from every quarter of this country and from many countries abroad have shown vital interest in this new machine. Many orders already have been placed and many machines now are in service breaking production records daily.

Complete descriptive data will be sent immediately upon request. For convenience just ask for Bulletin No. 35.



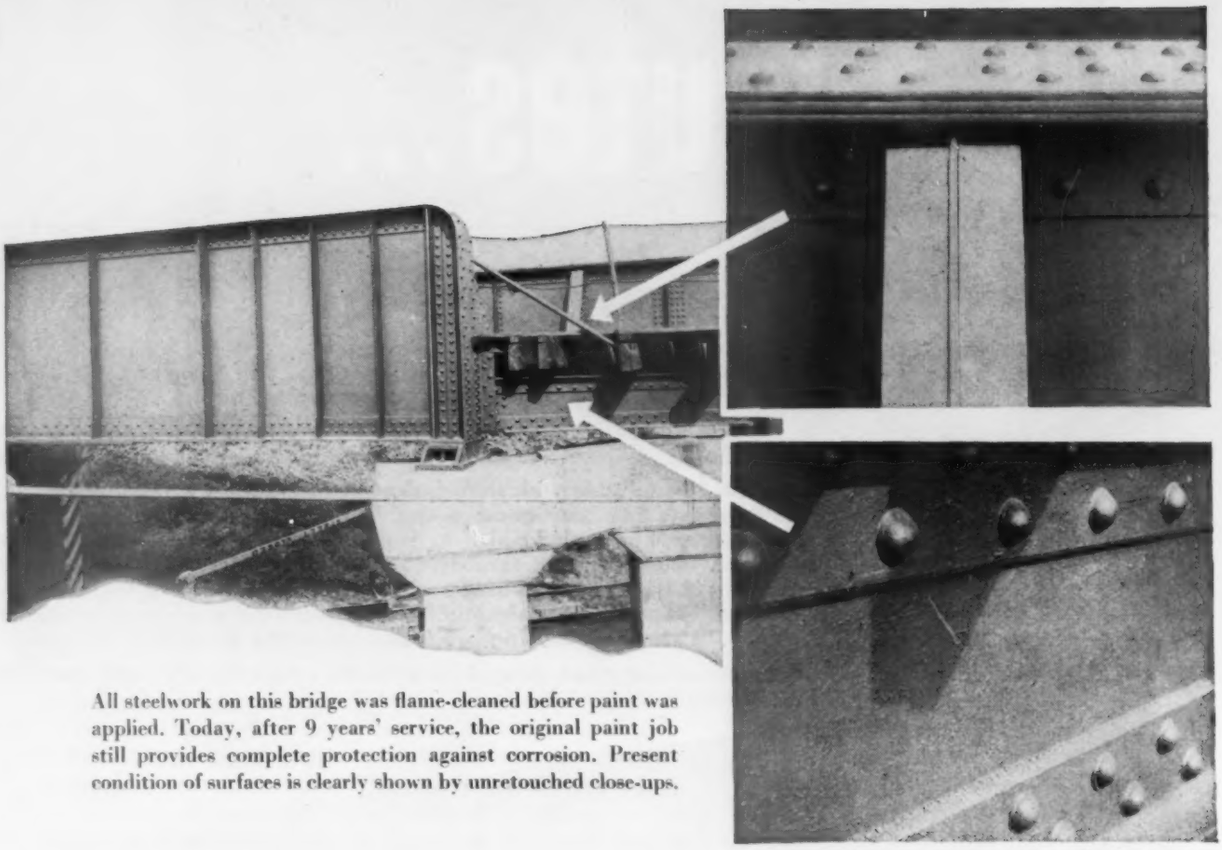
Can be used also as a standard engine lathe



THE AMERICAN TOOL WORKS CO.

Cincinnati, Ohio, U. S. A.

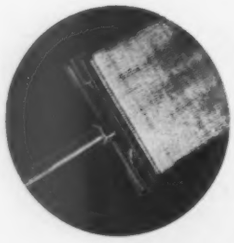
LATHES AND RADIAL DRILLS



All steelwork on this bridge was flame-cleaned before paint was applied. Today, after 9 years' service, the original paint job still provides complete protection against corrosion. Present condition of surfaces is clearly shown by unretouched close-ups.

Your Steelwork . . .

How Will It Look in 1960?



Steelwork you coat with good paint today can still look like new ten years from now, *if you flame-clean all exposed surfaces first.* And what you'll save on maintenance, because of increased protection due to flame-cleaning, should more than pay for all the apparatus and materials you need for the job.

Flame-cleaning is simple to do, requires little equipment, and costs little. A brush of oxy-acetylene flames pops off scale and drives out moisture. Paint applied to the warm, dry surface goes on quickly and smoothly, bonds tightly, and lasts longer.

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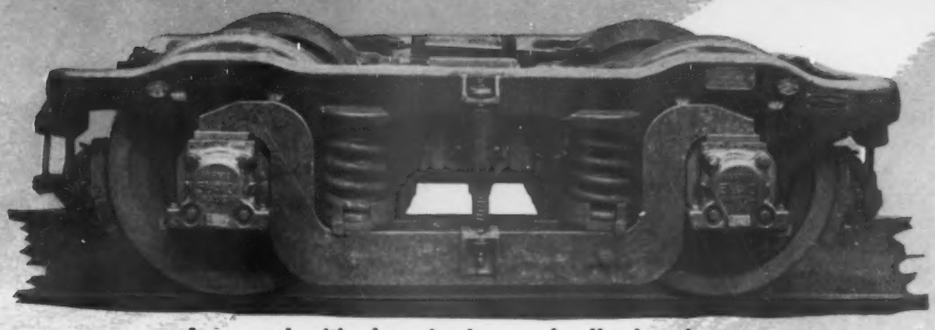

Arranged with clasp brakes and roller bearings

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Provides Smooth Riding
Protects Car Contents
Reduces Damage Claims

Especially designed to meet the demand for a practical, rugged light-weight truck for Box-Express Cars operating in passenger train service, this newest type **COMMONWEALTH** Equalized Swing-Motion Truck provides a smoother riding car, protects car contents, and greatly reduces upkeep costs.

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For dependability and real economy, it will pay you to apply **COMMONWEALTH** BX Trucks to *your* express, refrigerator and merchandise cars in passenger train service.

Pennsylvania Railroad 60-foot Long
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GENERAL STEEL CASTINGS

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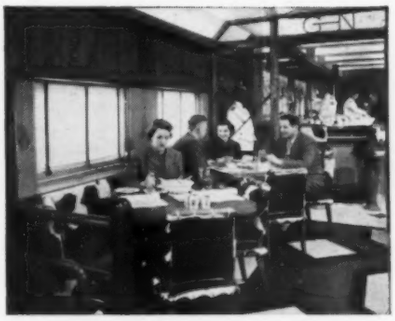
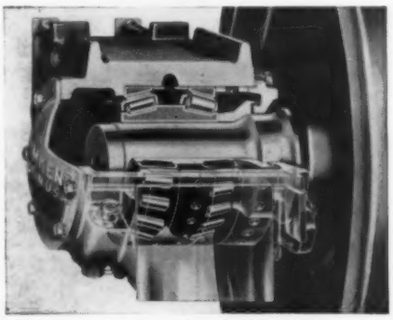


The Empire Builder's ranch car is a unique coffee shop and lounge.



Typical application of Timken bearings on passenger cars.

THE photo above shows one of the Great Northern's 5 new Empire Builders for 1951. Made up from a fleet of all-new passenger cars, each 15-car Empire Builder is equipped throughout with Timken® tapered roller bearings—from the mail baggage car to the smooth-riding observation car.

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BOX CARS HAVE BIRTHDAYS, TOO!

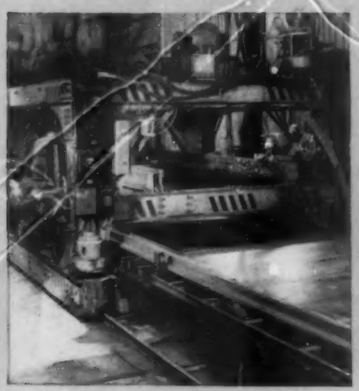
How old can freight cars get? It's the '$64 Question' in railroading because no one celebrates a freight car's birthday. Yet proof of retirement age is clearly shown in operating costs and revenues charged against each car. But in too many cases old cars never retire...they just seem to go along piling up unrealistic operating losses.

to build or to buy?

The experienced builder builds the best house... the best car...the best freight car. For besides experience, the builder who does the best job has the personnel, the assembly-line production facilities... everything it takes to build better cars in quantity.

Why duplicate a builder's investment when you can *buy* the best? Check with an A.C.F. representative on the realistic advantages of A.C.F. Standardized Design as applied to the production and speedy delivery of essential freight cars. Discuss in detail your future freight car needs...let A.C.F. build the best for *you*. American Car and Foundry Company, New York • Chicago • St. Louis • Washington Cleveland • Philadelphia • San Francisco.

All-welded underframes are speedily handled in rotator jigs for desirable 'downhand' welding.

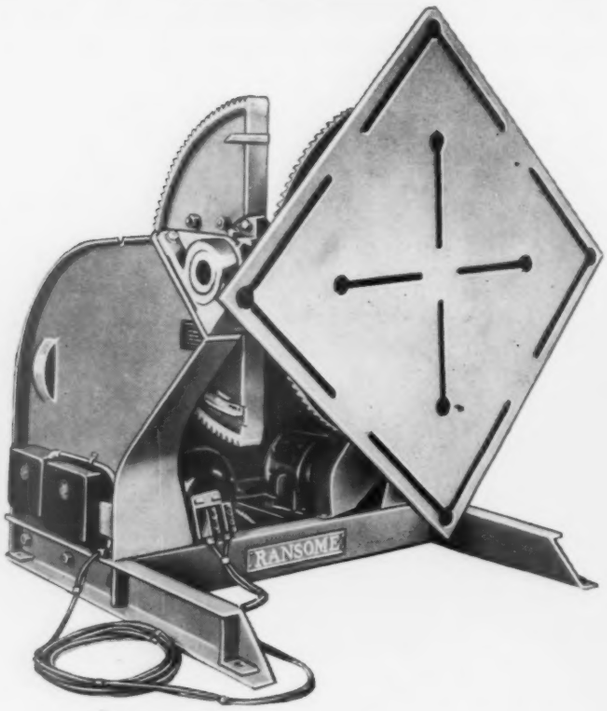


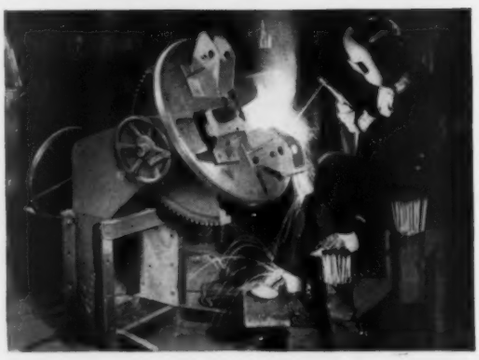
All-welded sides are a feature of the A.C.F. Standardized Box Car. Here automatic machines precision weld side sheets.

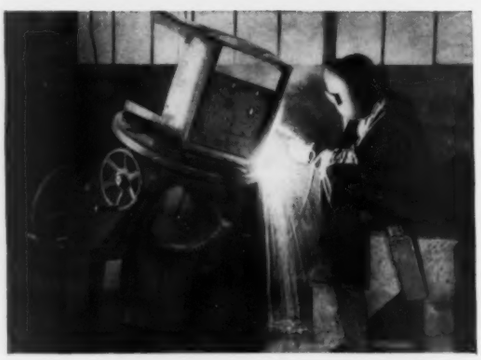
All-welded sides are applied to underframe. Jigs and fixtures assure duplicated accuracy in assembly-line construction.

A.C.F. CAR BUILDERS TO AMERICA'S RAILROADS

Lots of Different Pieces or Lots Alike...
THIS POSITIONER PAYS OFF







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. . . better welds . . . less rod waste

The universal table top makes the Worthington-Ransome Welding Positioner as profitable on *job* work as it is in mass production.

Those "T" slots make the table adaptable to any shape of work piece and a wide range of sizes. No special jigs or fixtures needed.

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THE EDITOR'S DESK

AN EDUCATIONAL OPPORTUNITY

During the third week in September five associations of mechanical supervisors will hold their annual meetings at the Hotel Sherman, Chicago, accompanied by an extensive exhibit by the members of the Allied Railway Supply Association, Inc. At the same time the Electrical Sections, respectively, of the Mechanical and Engineering Divisions of the Association of American Railroads will meet at the Hotel LaSalle, Chicago. These five mechanical associations, the Electrical Sections, and the two exhibiting organizations—the Allied Railway Supply Association and the Railway Electric Supply Manufacturers' Association which exhibited last year—constitute the Coordinated Mechanical Associations. The programs of the six railway meetings will be found elsewhere in this issue.

These six meetings and the exhibit promise a week of intensive education, during which the problems created by the rapid increase in the number of diesel-electric locomotives in service, the problems of freight-train brake maintenance which are in need of coordinated attack by all having to do with brake maintenance and train operation, and problems of freight-car conditions and their betterment will be under consideration by these organizations, some jointly by at least two of these groups.

It is significant of the respect in which the work of these organizations is held that the General Committee of the Mechanical Division, as it has done before, said in its report before the Division at its annual meeting at Chicago during the last week in June, "It is recommended that the mechanical departments of member roads allow as many of their supervisory officers as possible to attend these annual conventions and examine the exhibits in connection therewith."

Attendance is an important factor in determining the value of these meetings. The committee reports, most of which represent a lot of work directed by careful thought to crystalize experience of many roads and make possible improvements in techniques, depend for their effectiveness, on the number of interested persons in attendance who study and comment upon them at the meeting. In this respect their value to the railroads is proportional to the attendance. In the less tangible but nonetheless important aspects of association meetings—the informal contacts between members both in and out of the meeting halls—the value of the convention to its members and the railroads is enhanced even more than directly in proportion to the attendance. The work of these associations and their committees during the year, therefore, remains to be made valuable by the support offered by railway managements to the men in their organizations who can profit by attendance at the meetings.

RAILROADS PREFER TEXACO

More railroad Diesel locomotives in the U. S. are lubricated with TEXACO than with any other brand.

Western Railway of Alabama lubricates its road Diesel locomotives with Texaco Dieseltex HD.

DIESELS RUN CLEANER ...COSTS COME DOWN

...when you lubricate with TEXACO DIESELTEX HD

Run a Diesel locomotive lubricated with *Texaco Dieseltex HD* in your severest service. Run up, if you will, extra mileage between overhauls. Then note, when the engine is taken down, the clean top decks . . . the absence of harmful sludge, carbon and varnish. Note the free rings, the unhampered valve action, the slight amount of wear. These benefits mean lower maintenance costs and less fuel consumption.

Texaco Dieseltex HD is fully detergent and dispersive, made from an exclusive formula that embodies a special heavy-duty additive that greatly increases resistance to oxidation and sludge formation. *Texaco Dieseltex HD* meets the stringent requirements of leading Diesel locomotive builders.

Two Other Texaco Cost-Savers

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Whatever your lubrication requirements, there are Texaco Railroad Lubricants to fill them . . . and the unique Texaco Systematic Engineering Service to add further economy to your setup. Ask a Texaco representative for details. Just call the nearest of the Railway Sales offices listed below, or write:

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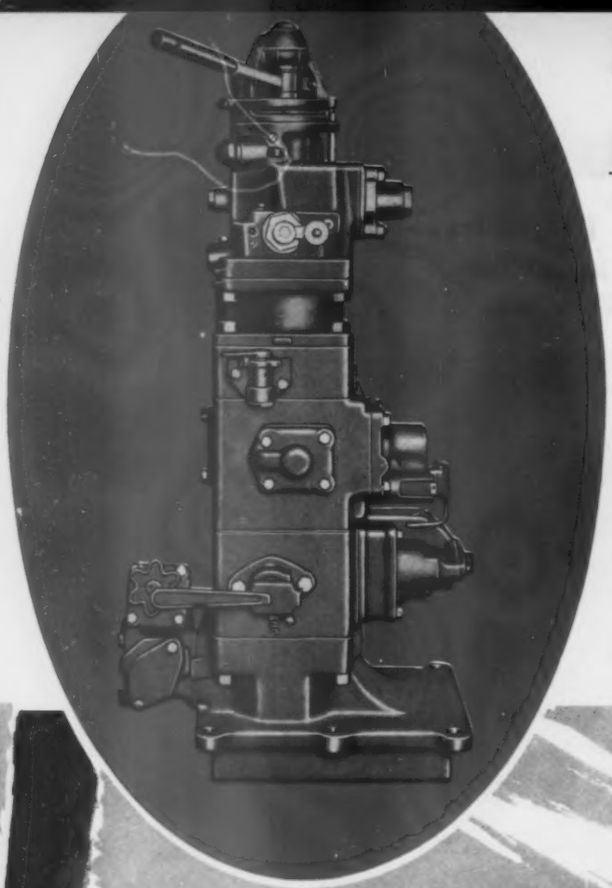

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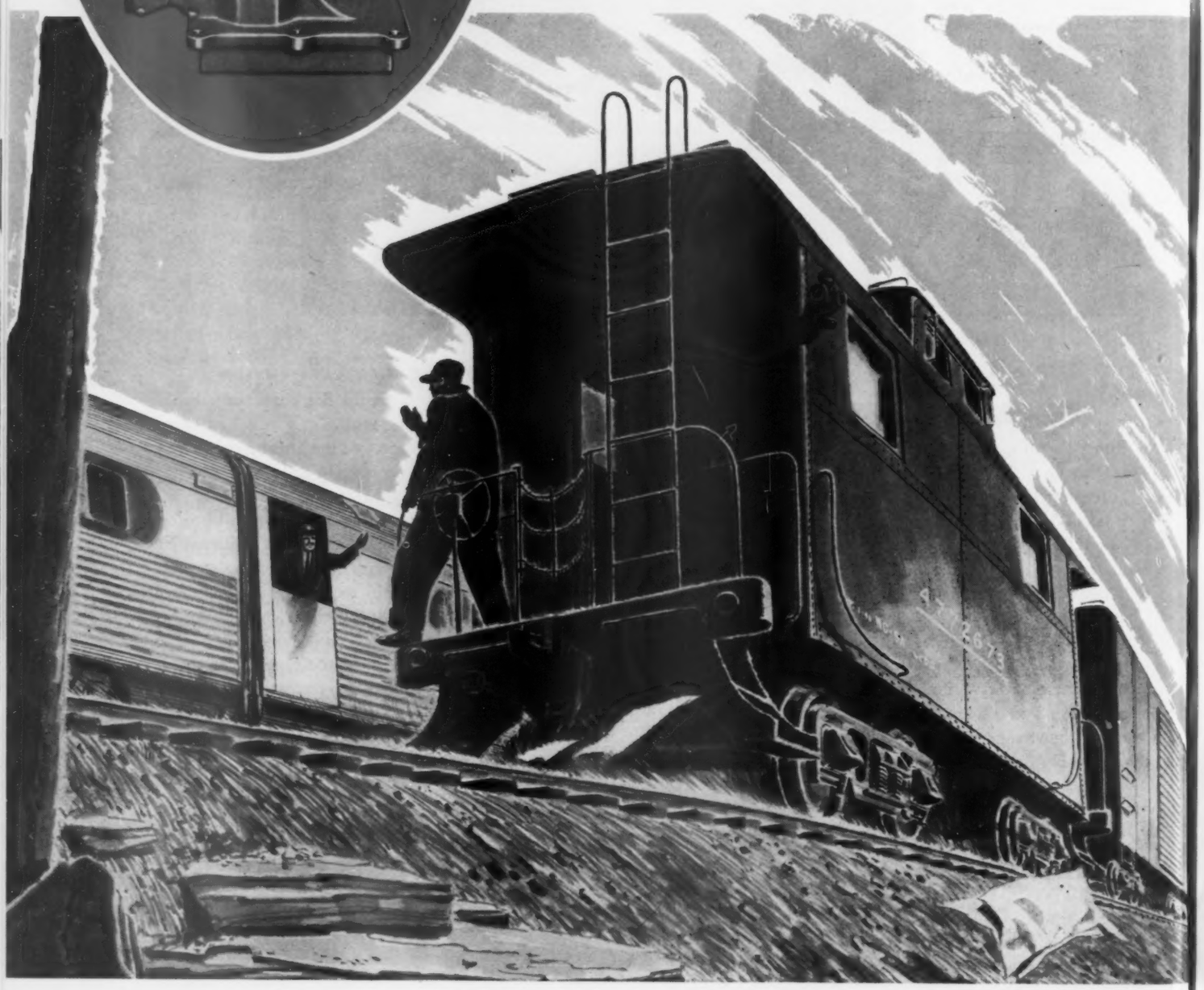

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AUGUST, 1951

VOLUME 125

No. 8

RAILWAY Mechanical and Electrical Engineer

Founded in 1832 as the American Rail-Road Journal.

Editorial and Executive Offices: 30 Church street, New York 7, and 79 W. Monroe street, Chicago 3. Branch offices: Terminal Tower, Cleveland 13; 1081 National Press bldg., Washington 4, D.C.; Terminal Sales bldg., Portland 5, Ore.; 1914 Minor avenue, Seattle 1, Wash.; 816 W. Fifth street, Los Angeles 13, Cal.; 1204 Russ bldg., San Francisco 4, Cal.; 2909 Maple avenue, Dallas 4, Tex.

Published monthly by Simmons-Boardman Publishing Corporation at Philadelphia, Pa. Subscriptions payable in advance. Postage free. United States, U. S. Possessions and Canada, 1 year $3. Other countries in Western Hemisphere: 1 year, $5. All other countries: 1 year, $7. 2-year subscriptions double the 1-year rate. Single copies 50 cents. Address Robert G. Lewis, Asst. to Pres., 30 Church street, New York 7.

The Railway Mechanical and Electrical Engineer is a member of the Associated Business Papers (A.B.P.) and the Audit Bureau of Circulations (A.B.C.) and is indexed by the Industrial Arts Index and also by the Engineering Index Service. Printed in U. S. A.

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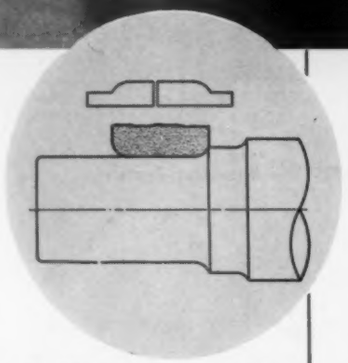
EXPANDING OR REPLACING EQUIPMENT?



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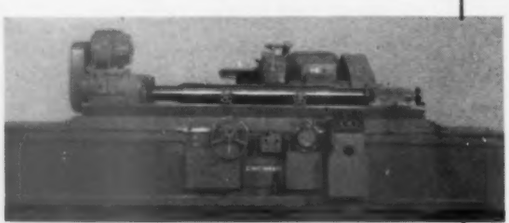

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RAILWAY Mechanical and Electrical Engineer

Brakes, Bearings and Wheels

Of all the Mechanical Division subjects discussed at Chicago these appear to demand special attention

At the opening session of the twenty-fifth annual meeting of the Mechanical Division, Association of American Railroads, held at the Congress Hotel, June 26 to 28, W. H. Schmidt, Jr., western editor, Railway Age told railroad men that it is their responsibility to convince other businesses that the large segment of the country's transportation plant which is publicly owned should be paid for on a business-like basis and in his remarks traced a parallel between conditions now existing in this country and those which produced the socialization of the railroads, trucks and canals in Great Britain. At the same session J. H. Aydelott, vice-president, Operations and Maintenance Department, A.A.R., outlined the problems which the railroads face during the coming months as a result of defense mobilization activities.

W. J. Patterson, member, Interstate Commerce Commission, addressed the meeting on the second day, calling attention to a number of conditions affecting safety which are in need of improvement.

The opening session began a program for the presentation and discussion of 17 technical reports. During the meeting the following were elected to serve as members of the General Committee for a two-year term expiring in June 1953: F. K. Mitchell, manager equipment, New York Central system; A. G. Kann, general superintendent equipment, Illinois Central system; G. W. Bohannon, chief mechanical officer, Chicago & North Western; E. R. Battley, chief motive power and car equipment, Canadian National, and D. S. Neuhart, general superintendent motive power and machinery, Union Pacific. Officers were elected at the last annual meeting to serve two-year terms and none was elected this year.

In its report the General Committee called attention to the fact that the board of directors of the A.A.R. at a meeting on November 16, 1950, unanimously approved the proposed standard floor plans for passenger-train cars as prepared by the Passenger Car Design Committee of the American Railway Car Institute in cooperation with the Committee on Passenger Car Specifications of the Mechanical Division for submission to the member roads as recommended practice. It also called attention to the annual meeting of the Coordinated Mechanical Associations which will be held at Chicago September 17-19. The committee recommends that mechanical departments of member roads allow as many of their supervisory officers as possible to attend these annual conventions and examine the exhibits which will be assembled in connection with them.

Presiding during the meeting was B. M. Brown, general superintendent of motive power of the Southern Pacific, the chairman of the division. Other officers of the division are H. T. Cover, chief of motive power, Pennsylvania, vice-chairman; V. R. Hawthorne, executive vice-chairman, unable to be present because of illness; Fred Peronto, secretary; and J. R. Jackson, mechanical engineer.

In tracing the parallel between conditions now existing in the United States and the pressures which produced the socialization of railroads, trucks, canals and docks in Great Britain 3½ years ago, Mr. Schmidt said:

"Ideology—the socialist's timetable—obviously was an important reason for Britain's step. So also was the long-held belief by railroad employees that their lot would be bettered through government ownership. But equally important was the conviction by many—including many adherents of the Conservative and Liberal parties who are businessmen—that the privately owned, taxed and self-sustaining railroads could not cope with the loss of traffic to trucks and buses on the public highways.

"Our own railroads here must exist in a climate far more hostile than that which existed in Britain before socialization. Public aids to highway and air transport here are much bigger and more serious than they were in Britain. The outright support of inland waterways from general taxation, which is common here, did not obtain in Britain. Thus, while we have neither doctrinaire socialists nor unions which consistently support government ownership, we have the third disease in a more virulent form than it existed in Britain; i.e., public support of competing forms of transport in so unbusinesslike a fashion that their prices to the public are artificially depressed and bring about progressive diversion of traffic from privately supported transport facilities."

Mr. Schmidt pointed out that pressure for continued public subsidization of air, water and motor transportation does not come, for the most part, "from long-haired

V. R. Hawthorne
Executive vice-chairman

B. M. Brown
Chairman

H. J. Cover
Vice-chairman

F. Peronto
Secretary

A. A. R.
Mechanical Division
General Committee
1950-51

J. R. Jackson
Mech. Eng.

R. G. Henley

F. K. Mitchell

A. G. Kann

A. K. Galloway

G. W. Bohannon

J. P. Morris

M. R. Brockman

E. R. Battley

D. S. Neuhart

J. F. Ryan

radicals, from union leaders, or from the public in general."

To get justice, he asserted, the railroads must first convince the leaders of other businesses that the present policies they advocate are leading to complete socialization of all transport. "No businessman," he said, "can look on the experience of Britain during the past three and one half years and regard that prospect with indifference.

"The fact that the railroad employees of Britain are far from pleased with the working-out of government ownership of transport—and say so openly and bitterly—is an important argument by which our railroads can rouse their own employees to action against influences which weaken the railroads and will, if unchecked, lead surely to government ownership of all transport."

Materials, Manpower and Fuel

Mr. Aydelott classified the pressing problems faced by the railroads during 1951 under three heads: materials, manpower, and fuel. The difficulties of securing an adequate supply of materials, he said, arise primarily from the demand for our own and our European allies' defense effort. Part of the increased demand for freight cars, he said, arises from the increased volume of production in many fields since the close of World War II. The railroads, he said, have bragged too much about their capacity to meet emergencies. He stressed the need of more cars now, pointing out that, because of the tremendous rate at which old cars have been retired, the gain in the number of freight cars in the 12 months ended May 31 was less than 3,000.

The Defense Transport organization has supported the railroads' effort to overcome the shortages of the past year and its heavy loading orders have helped some, but Mr. Aydelott is not sure whether these orders have been saving cars or only have seemed to do so, causing the railroads to lose business to the highways. One of the dampers on the enthusiasm of the public in support of the mobilization effort is the maintenance of the five-day week. As long as this is continued, Mr. Aydelott feels that it will be difficult to secure hearty support in carrying out measures to save car-days by heavy loading and prompt loading and unloading.

Mr. Aydelott dealt with the effect of the new draft law which discourages deferments by extending the termination of the obligation to render military service from the age of 28 years to 35 years for deferred men. He told of the management manpower committees which have been set up at large employment centers on which there are railroad members and said that the railroads would soon be advised of the personnel and locations of these committees. These committees, he believes, will give the railroads an "even break" in the distribution of manpower.

While the railroads are consuming as diesel fuel only two per cent of total petroleum production, Mr. Aydelott said that diesel fuel is becoming competitive with heating oils and with the large amounts of kerosene being used for jet plane propulsion. He urged the Mechanical Division to study diesel fuel specifications to find out how much certain characteristics of the fuel could be lowered to increase the base of supply without causing operating difficulties.

In closing, Mr. Aydelott said that every statistical yardstick of maintenance and operating efficiency had improved in 1950. But, he said, hot boxes are still an acute problem and, to solve it, there must be 100 per cent observance of all of the requirements of the rules.

Disturbing Defects

Chairman Brown, in summing up the problems before the Mechanical Division, laid emphasis on defective equipment and the continuing hot-box problem. He said, in part:

"Defective equipment, particularly freight cars, continues to be one of the prevalent causes of accidents, derailments, lading damage and delays to freight in transit.

"The report of the Committee on Train Accidents of the A.A.R. Safety Section, dated May 4, 1951, shows that during 1950, 34 per cent of train accidents resulted from defects in or failure of equipment; and the trend has been generally upward for the past 10 years.

"Serious accidents have occurred this year from such causes as broken truck frames, couplers dropping on rails, burned off and broken journals, defective wheels, brake rigging coming down and other items of equipment defects.

"Letters have been issued on several occasions since January 1 of this year by the executive vice-chairman of the division, calling attention to many items of car maintenance that are causing trouble and in need of special attention. Among these are maintenance of dust-guard plugs and seals and journal-box lids to keep rain, snow and foreign matter from contaminating box packing; the application of heavy coats of paint or other protective coatings to truck side frames and bolsters in violation of the rules, nullifying proper inspection; importance of cleaning drain holes in the bottom section of truck side frames to avoid excessive corrosion; importance of proper inspection and repairs while on repair track to couplers, draft gears and attachments, truck sides and truck bolsters, journal boxes, brake beams, hangers, safety supports, piston travel, leakage in the brake system, safety appliances and condition of wheels to see that cars are in good condition for safe transport and to avoid shopping of the car under load, causing delay to car and contents.

"One of the most aggravating problems still confronting the railroads is the perennial hot box. Higher sustained operating speeds and fewer stops with diesel locomotives, greater utilization of equipment, improved yards and signaling and other factors of modern railroading, have all contributed to this problem. Hot boxes not only delay the steady flow of essential traffic, but also involve serious hazard of accident.

"This is not a new subject before this division and it has not been neglected. The General Committee and the other committees of the division have continued to give it serious study, and during the past year have taken emergency action to improve specifications for packing and journal box oil. Other action taken includes reducing the period for repacking journal boxes from 15 months to 12 months; increasing the mechanical inspection staff for the purpose of itensifying checking into journal-box lubrication practices; encouraging the use of packing retaining devices; increasing and broadening personnel and representation of the Committee for Lubrication of Cars and Locomotives; and continuing research to improve the design of bearings and quality of lubricating materials.

"The efforts are in the right direction, but the results have been disappointing. Hot boxes are still causing serious trouble; some of us may be inclined to blame foreign cars and minimize our own shortcomings. The solution lies in the hands of each individual railroad which must adopt sound maintenance, inspection and lubrication practices, secure the proper materials, and

establish operating rules that will permit proper application of these practices, and all departments on the railroads must cooperate to bring this situation under control."

High Speed and Heavy Loads

William J. Patterson, I. C. C. commissioner, in commenting on the many equipment problems that are confronting the railroads today, said, in part:

"Recent developments in motive power and cars have contributed to a considerable extent toward train operation at higher speeds with long and heavier trains traveling greater distances without intermediate stops. This trend put a greater responsibility upon mechanical officers to know that the design and maintenance of equipment is adequate to meet the demands. Failure of truck frames, wheels, axles, couplers, other portions of car structures, or power brakes can be disastrous, not only in so far as a particular train is concerned, but to other trains occupying the same or adjacent tracks.

"A major problem today is the failure of steel wheels. In modern passenger-car construction the four-wheel truck has, generally speaking, replaced the six-wheel truck. Total weight reduction, if any, in the so-called light-weight passenger car is slight and as a result the individual wheel loading has been increased considerably. This increase in wheel loading, together with greater speeds and higher braking ratios, has resulted in numerous wheel replacements because of thermal cracking. The prevention of serious accidents because of wheel failure must necessarily require frequent and thorough inspection by competent employees.

"The number of cases where driving wheels under diesel locomotives have failed because of thermal cracking, fractures originating at the hot stamp markings, or progressive fractures originating in rims and plates because of the development of excessive internal stresses, is alarming. Yet we find that regular runs are being lengthened considerably and with little or no inspection at intermediate terminals. During the early part of this month we investigated the derailment of a passenger train which resulted in injury to a number of passengers and employees, which was caused by the failure of a 36-in. Class C driving wheel under the second unit of a two-unit diesel locomotive. The train was accelerating after making a regular station stop and had reached a speed in excess of 60 mph. when 57 in. of the rim broke out of the wheel. After severely damaging the rails for a distance of more than 1,400 ft. this pair of wheels was derailed and then continued on the track structure for another 1,200 ft. before coming in contact with a switch and damaging the track to the extent that the following eleven cars of a 13-car train were derailed. This accident occurred on the westward track of a double track line and both main tracks were obstructed by the derailed cars. Approximately eight minutes later an east-bound passenger train was brought to a stop by a flagman at the scene of the accident. Had there been a slight difference in the timing the results might have been far worse.

"Examination of the wheel after the accident disclosed that there were four old progressive fractures in the rim and plate. One of the fractures, approximately 1½ in. below the rim, extended through the plate for a longitudinal distance of more than 16 in.

"One other serious factor in considering diesel wheel failures is the fact that enginemen, riding in the control compartment of the leading unit, are not in a position to readily detect defects in the running gear of trailing units. This is clearly illustrated in the derailment to which I have just referred. In this case the enginemen were not aware of anything being wrong until the train had parted, causing an emergency application of the train brakes, although the broken wheel had badly damaged the rails and had been derailed for a total distance of almost 2,700 ft. before the general derailment occurred.

"This is a serious matter. Railroad officers and members of the special joint committee consisting of representatives of manufacturers and railroads should give prompt and serious consideration to this problem.

"The service demands upon our freight-train power brakes have become severe in recent years. We find a large number of cars with the obsolete K type brakes still in service and, even more alarming, we find considerable evidence of lack of proper maintenance on cars equipped with AB brakes.

"Although the investigation, which led to the adoption by this division of the AB brake in 1933 and to our order of September 21, 1945, in Docket No. 13528, was instituted in 1922, we find that as of March 31 of this year there were 116,518 cars of U. S. ownership still in interchange service with the K type brake. Of this number, 76,241 are scheduled for conversion to AB brakes and the remaining 32,393 scheduled for retirement.

"In view of the current shortage of cars we found it necessary in the public interest to further amend our order of September 21, 1945, in Docket No. 13528, so as—

'To require that all cars be equipped with AB brakes or or before June 30, 1952, except as indicated hereinafter:

'To prohibit the movement by any respondent after June 30, 1952, of any of their cars used in freight service not so equipped unless such car is received in interchange from a line other than the owning line or unless such car is moved on its own rails by an owning line; and

'To prohibit the movement by respondents after December 31, 1952, of any car used in freight service (including the cars of private carline companies) not so equipped.'

"Your committee members have been negotiating with representatives of our Bureau of Safety for some time relative to the rules contained in the pamphlet entitled 'Maintenance of Air Brake and Air Signal Equipment on Locomotives and Cars.' Considerable progress has been made toward formulating a satisfactory set of rules, but up to this time no provision has been made to insure compliance with such rules. Rules not uniformly complied with and which are not enforced are of but little value. The difficulties experienced during the last few winters with excessive brake pipe leakage, only a portion of which was a result of inferior material, the excessive number of inoperative power brakes found by inspectors of the Bureau of Safety while making terminal air-brake tests, and observations made at various train yards and repair tracks are indications of failure on the part of many railroads to properly comply with the existing air-brake maintenance rules. One of the most destructive elements to safe operation of a railroad is the tolerance of rule violation. It is evident that there is a need for some action to make these rules mandatory and for some provision to insure proper compliance by all member railroads.

"Even though all cars were equipped with AB brakes and properly maintained the power brake situation would not be entirely satisfactory. The wide range in braking ratio of from 18 per cent, or often lower, to 75 per cent

or higher of the weight of a car results in unequal braking and serious damage to equipment and lading, particularly in the operation of long trains.

"Some minor changes in design have been made by the manufacturers of the ABLC variable load brake. These improved devices have been in service on 398 lightweight hopper cars for almost two years and, I understand, have been functioning very well. If this brake has been sufficiently developed to properly reduce the range in braking ratios between empty and loaded cars action should be promptly taken to make it standard where necessary to obtain proper spread in braking ratio.

"As a member of the Committee on Harriman Awards I have been much interested in the past few years with respect to the manner in which injuries sustained by railroad employees are being reported to the Commission. I have noted that the greatest opportunity for the occurrence of these injuries appears to be in connection with maintenance, both mechanical and right-of-way. undoubtedly this is partly due to the nature of the work performed, but the accident records also indicate that carelessness is a heavily contributing factor. A great many injuries result from carelessness of fellow worker and it behooves each man, not only to consider his own safety while at work but also that of those working with or near him.

"With respect to reporting injuries to the Commission as required by law and rules, I am quite disappointed. The files show that many injuries that should have been reported were not included in the reports. With some carriers there can be little doubt but that this has been done deliberately, but in most instances ignorance of the Commission's reporting rules seems to be the underlying cause. I am led to believe that the majority of foremen and supervisors do not have a correct understanding of the reporting requirements; many of them are under the impression that if the injured party can report for duty within the three-day period and is able to perform some portion of his duties, this is all that is necessary to remove the injury from the reportable class.

"This understanding of the rule governing reportable injuries is not correct. Under the rule the employee must be able to perform *all* the usual duties of his occupation without assistance, and not merely certain work that he may be able to do during recovery. Many foremen and supervisors believe that if the employee can report for some sort of work without loss of payroll time in excess of three days, the injury is not reportable. Loss of payroll time is not to be considered. The determining factor is the period the employee is prevented by the injury from performing any and all the usual duties of his occupation.

"I might also mention that a severe penalty is provided by law for failure to report injuries as required by the Commission's reporting rules and regulations. The fine for each violation may be as much as $100 per day for each day beyond the 30 days allowed in which to file the reports. This might easily prove costly and some roads have paid fines for failure to report injuries.

"You should not allow zeal for a good personal injury record in your department to subject your employer to liability of court action and possibly heavy fines. Remember that in determining whether an injury is reportable, the reporting officer must depend to a great extent on the information furnished him.

"The Locomotive Boiler Inspection Act of 1911, as amended, and the rules prescribed thereunder establish minimum safety requirements for steam locomotives and locomotive units propelled by power sources other than steam.

"It is significant that safety, dependability, economy and road performance are characteristics that change with and are dependent upon the physical condition of locomotives. It is generally recognized that a high standard of maintenance will result in a high standard of safety. We also know that proper inspection and adequate repairs are essential to reliable and durable locomotives and that the attendant costs per unit of transportation are less than for indifferently maintained locomotives.

"The rapid transition from steam power to use of diesel-electric locomotives has been accompanied by the usual problems incident to what may be termed a revolution in motive power. Facilities for maintenance of steam power are not usually suitable for diesel-electric locomotives; personnel trained in steam locomotive maintenance must be re-educated, and the responsibility placed upon supervisory officers has been increased.

"Some of the features of diesel-electric locomotive operation which our experience indicates should be given careful attention are: Maintenance of clean engines, fuel-oil tanks and electrical equipment. Oil upon floors of passageways has resulted in numerous injuries as a result of falls. Dirty and fouled electrical equipment has caused flash overs and resultant injuries and fires have resulted from debris on fuel-oil tanks.

"Crane-case explosions resulting from improper maintenance of engines and lubricating systems have been the source of a number of injuries.

"Lubrication failures of support bearings or traction-motor bearings have caused several serious accidents.

"Operation of diesel-electric locomotives on through runs with cursory and inadequate inspections at intermediate inspection points encourages accidents because defects which develop en route either are not discovered in the superficial inspections made or, if discovered, are passed by on the 'let's take a chance' gamble. I strongly urge that immediate consideration be given to establishment of thorough and meticulous inspections of through trains at intermediate points and positive instructions that units found with reportable and dangerous defects be set out for proper repairs be placed in effect; diesel locomotives do not now carry their fair share of the braking load.

"There are numerous other problems such as obsolete and deteriorated truck frames, hot boxes, defective couplers and draft gears, that you are familiar with and will give consideration."

Locomotive Construction

Auxiliary Air Supply

There have been several accidents involving diesel-electric locomotives in which the brake cylinders were damaged or other damage occurred, which resulted in loss of main reservoir air pressure, and the locomotive unit separated from the train or from its mate units, and continued in motion out of control. At a meeting of the Safety Appliance Committee on June 26, 1950, the matter was assigned to a joint committee consisting of representatives of the Committee on Brakes and Brake Equipment, and the Diesel Section of the Committee on Locomotive Construction.

The Joint Committee met with Commissioner Patterson and other representatives of the Interstate Commerce Commission on August 14, 1950, at which Mr. Patterson proposed a change in the rules to cover the provision of a definite supply of air to operate the controls of a locomotive having a pneumatically

actuated system of power controls, which would be available even though the locomotive suffered complete loss of main reservoir air. The wording of the proposed amendment to the rules was approved by the Safety Appliance Committee at a meeting on September 26, 1950, and was subsequently issued unchanged by the Interstate Commerce Commission on October 4, 1950 under Ex Parte No. 174, Rules and Instructions for Inspection and Testing of Locomotives, Notice of Proposed Rule Making, and an order was issued on January 29, 1951, amending Rule 205 (a) of the Laws, Rules, and Instructions for the Inspection and Testing of Locomotives Other Than Steam, as follows:—

"Each unit that has a pneumatically actuated system of power controls shall be equipped with a separate reservoir of air under pressure to be used for operating such controls, other than brake controls, which reservoir shall be provided with means to automatically prevent loss of pressure in event of failure of main reservoir air pressure, shall have storage capacity to permit not less than 3 complete operating cycles of control equipment and shall be so located that it will not be readily susceptible to damage. Each unit built before January 1, 1951, that has a pneumatically actuated control system of power control shall be so equipped the first time said unit receives repairs of a general nature but not later than January 1, 1952."

The new rule of itself provides only for a supply of air for the operation of the controls, and prescribes suitable tests to insure an adequate supply for the purpose. It does not, however, prescribe how this air is to be used in stopping a locomotive lacking other means. The only obvious means are the dynamic brake, if available and operative, and reversing the traction motors.

The efforts of the joint committee were directed to working with the builders, principally in connection with use of the air provided by the new rule. Following a preliminary meeting on September 21, two additional meetings were held on January 18 and February 21, 1951 to develop the changes required on existing locomotives: (1) To meet the requirements of the new rule as written; and (2) to coordinate the changes required on locomotives of the various builders so that as nearly as possible the procedure required to reverse the traction motors would be identical on locomotives of all manufacturers.

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The various builders are prepared to furnish the necessary information direct to the railroads to cover both phases of the subject on existing locomotives, and are aware of the need to furnish new locomotives complying with the new rule which are so arranged that the traction motors can be reversed in the event of loss of main reservoir air pressure.

The subject falls into two main divisions, namely:

(1) Compliance with Rule 205 (a) which provides only for a dependable source of air for operating controls in the event of loss of main reservoir air pressure. (2) Making the supply of air provided under the new rule effective in stopping a locomotive otherwise out of control, by reversing or "plugging" the traction motors.

Under Rule 205 (a) the railroads are required: To provide a supply of air which will be available in the event of loss of main reservoir air pressure; sufficient in capacity to permit three complete reversals of control equipment; and in a location not readily susceptible to damage, on all locomotives delivered after January 1, 1951, and on all locomotives now in service not later than January 1, 1952.

The joint committee's investigation has indicated that with few exceptions diesel-electric locomotives delivered by the builders represented at the meetings were equipped with separate reservoirs isolated by means of a check valve to prevent the loss of pressure in the control air reservoir in the event of loss of main reservoir pressure.

In order to obtain a definite understanding as to what constituted three complete reversals of control equipment, an opinion was requested from the director of the Bureau of Locomotive Inspection. The following is quoted from his reply of January 31, 1951:

"For the purpose of the rule we consider one cycle may be defined as operation of controls actuated by air pressure incident to following described movements:

Throttle lever: Movement from full open to closed position and then to full open position.

Reverse lever: Movement from position for forward movement to neutral position and then to position for reverse movement.

Transition lever: Movement from full advanced position to 'off' position and then to full advanced position."

In many instances it will be necessary to change the supply of air for auxiliaries other than controls from the control air reservoir to direct from the main reservoir, to conserve the supply for controls only. If this fails to comply, the pressure in the control reservoir can be increased. Failing in this, additional reservoir capacity must be installed.

A suggested procedure for conducting tests for compliance with Rule 205 (a) follows:

1. Start engine and charge compressed air system to full pressure. Alternate:—Charge control air reservoir to slightly above specified control air pressure from house air lines.

2. Shut down engine, blocking any alarm relays to eliminate bell ringing. Alternate:—Engine is down; block alarm relays.

3. Set all equipment in RUN position, that is:—Throttle wide open; Selector or transition lever in full position and Reverser lever in forward position.

4. Blow down main reservoir to zero pressure. Alternate:—Install three-way cock, or side vent cut-out cock in advance of check valve for control air reservoir so that pressure on upstream side of check valve can be reduced to zero by venting through side vent or open outlet of three-way cock, or install pipe tee with plug between cut-out cock and check valve, and reduce pressure on upstream side of check valve by removing plug.

5. Check leakage of control air. If leakage exceeds three (3) pounds per minute, make necessary repairs before proceeding with test.

6. Proceed with test of three reversals of control equipment, starting with controls in the position shown in Item 3. Sequence of operations will be governed by interlocks on controls, functioning of the controls, and presence or absence of transition levers, or separate dynamic or regenerative braking levers. It is important that each control item be operated through three complete reversals, that is:—Throttle or controller handle from full open to idle or off and back to full open, repeated three times. Reverser lever from forward motion to reverse; from reverse to forward; and from forward to reverse. Transition lever, if present, from full position to either off or No. 1 position, depending on interlocks and functioning of contactors. Repeated three times. Dynamic or regenerative brake lever, if present, from full position to off, and back to full; repeated three times.

7. If control air pressure falls to a point where controls fail to operate, it will be necessary to—(1) Provide additional control air reservoir volume, (or) (2) Remove auxiliaries other than controls from control air reservoir and supply auxiliary air direct from main reservoir, preferably from second main reservoir, (or) (3) Increase control air pressure. (Inquire of builders as to maximum permissible control air pressure).

Considerable time will be saved by using one of the alternate methods under Item 4, in preference to reducing the main reservoir pressure to zero. The Committee on Brakes and Brake Equipment recommended the installation of a side vent cut-out cock for this purpose as standard equipment on all new locomotives.

The matter of leakage from the control pressure system is of considerable importance and particularly in cases of small reservoirs requiring an exceptionally high degree of maintenance on the check valves and operating valves on the controls to keep the leakage within safe limits. Such maintenance may prove to be excessive or impracticable in everyday practice. The only solution in this case appears to be an increase in control air reservoir volume. However, in border line cases, proper control of leakage may save the need for a larger reservoir.

Location to Avoid Damage—The requirement of the new rule

—"and shall be so located that it is not readily susceptible to damage," may lead to some difference of opinion as to whether the existing location in individual cases satisfactorily meets the rule. It appears that susceptibility to damage must be tied into the type of accident which would normally result in a locomotive continuing on its way on the track and out of control. To date such accidents have resulted when one or more brake cylinders or brake cylinder pipes have been damaged to the extent that main reservoir pressure is lost through the broken cylinders or pipes. It seems that any location within the body of a locomotive or above the deck should be satisfactory, since any accident of sufficient violence to damage a control reservoir so located, would invariably result in derailment or otherwise halting the progress of the locomotive.

The information collected by the Joint Committee has concerned only the diesel-electric locomotive. The rule however concerns all types of locomotives other than steam and railroads operating straight electric, gasoline electric, or other types, should check such locomotives for compliance with the rule.

MAKING THE SUPPLY OF AIR EFFECTIVE.—It was this phase of the matter which was most difficult to gather information on which was suitable for submission to the railroads because of the variation in practices of the several builders. It was the aim of the joint committee to have all necessary changes to existing equipment be so made that the procedure to be followed by the enginemen in reversing or plugging the traction motors would be the same on all locomotives. It is believed that this has been accomplished. The following outlines the procedure agreed upon:—

PROCEDURE TO STOP LOCOMOTIVES OTHER THAN STEAM IN THE EVENT OF LOSS OF MAIN RESERVOIR PRESSURE.—1. On locomotives equipped with dynamic brakes, proceed to apply dynamic brake as usual. 2. On locomotives not equipped with dynamic brake, or if dynamic brake fails to slow down locomotive:

(a) Move engine throttle to idle position.
(b) On locomotives with manual transition, move transition lever to off position, or to No. 1 position as required by control interlocks and functioning of the contactors.
(c) Move reverser lever to opposite position.
(d) Enginemen to get set for severe retarding action. It should be noted that the action is more severe at lower speeds.
(e) Move throttle lever to position No. 1 only.

Caution—Reversing traction motors to stop a locomotive otherwise out of control is the last resort when all other means have failed. Damage to traction motors and wheels is certain to result if this is necessary at any appreciable speeds. Under no circumstances should reversing traction motors be resorted to as an aid to air brakes. With pressure in the brake cylinders, reversing or plugging the traction motors will resut in sliding of the driving wheels and a net reduction in the retarding effect.

The discussions developed that:

(A) The action of the PC switch, where used, must be such as to have no effect on the main power contactors, or to be so arranged that it would automatically reset so that main contactors will close when the throttle is moved from idle position to position No. 1, the last step of the procedure.

(B) The action of the ground relay must be such as to have no effect on the main power contactors. This is for the reason that when traction motors are reversed under the circumstances under discussion, a flash-over of the motors is very possible, normally resulting in ground relay action, and to insure that such action would not nullify the engineer's effort to stop the locomotive, the ground relay action should not affect the main power contactors.

(C) Some locomotives delivered in the past equipped with dynamic brakes, were so arranged that dynamic braking was effective only in the forward motion. To enable the enginemen to try the dynamic brake, before resorting to reversal of the traction motors, it was agreed that where possible dynamic brakes and controls be arranged so that dynamic brakes would be effective in both directions.

In multiple unit operation, the possibility of having a locomotive unit detach itself from the following unit can be eliminated by locking the couplers between the units, which is entirely permissible on locomotives which are not to be separated enroute by trainmen. It should be definitely understood that it is not permissible to lock the couplers between the locomotive and the train. If this is done, it is necessary that the lock block itself be secured. Any locking device which secures the lock lifter, or the uncoupling rigging will not be effective for this purpose. The report of the Joint Committee shows methods employed by one railroad for the various types of couplers involved. It would be highly desirable to provide protective means for the vulnerable parts such as brake cylinders, brake cylinder pipes, main reservoirs and their attendant piping, to minimize the possibilities of accidents of the type under discussion. In general, the following situation must develop:

(1) The locomotive must suffer damage to the main reservoirs or piping, or to the brake cylinders to cause the loss of main reservoir air pressure; (2) The locomotive or a unit suffering such damage must separate from the train or from succeeding units; and (3) Such locomotive must remain on the track and continue in motion without normal functioning of the air brakes.

The fact that in a number of instances the main reservoir pressure was dissipated through one or more broken brake cylinders or brake cylinder pipes suggests the possibility of introducing suitable stop valves in the brake cylinder lines. These valves would function so as to stop the flow of air in event a brake cylinder or brake cylinder pipe was badly damaged. By suitably segregating the brake cylinders into groups, preferably as between the sides of a locomotive unit, a single valve could protect several brake cylinders. Such arrangements would not only prevent the loss of main reservoir air through the damaged cylinders, but would permit any undamaged cylinders not affected by the stop valve to function as usual.

This matter was discussed but because of the apparent complications, and the number of valves required to furnish complete protection, the matter was not progressed at that time and is not mentioned in the joint committee's report. Complete protection would involve installing such valves for each brake cylinder, and possibly at strategic locations in the brake cylinder lines, and in main reservoir lines. However, partial protection could be provided as mentioned above, and it seems that any device which would definitely prevent the loss of main reservoir air, and have the possibility of having the brake cylinders on even one side of one truck functioning would be preferable to complete loss of the air brake operation.

Locomotive Sanding System

The joint sub-committee from the Signal Section and the Mechanical Division having as its assignment a study of the possible influence of locomotive sanding on track circuit shunt failures, prepared a report including the recommendation that the recommended practice for Locomotive Sanding System in the Manual be reviewed and brought up to date, taking into consideration that every effort must be made to avoid excessive build-up of sand on the rails. Considering that the desired end results are effective sanding for traction and braking without sufficient sand build-up on the rails under any condition to cause a false signal indication, the first approach was a study of the pattern of the sand delivery obtained with the several sizes of sand pipes and diameters of converging nozzles commonly used. Sand traps from three manufacturers were used in the tests and the tests were of sufficient breadth to develop that the pattern of delivery for a given pipe or nozzle size remains approximately the same throughout the range of delivery rate that may be used.

The committee recommended, as a letter ballot proposition, that pages F-238 to F-240 of the Manual be revised in accordance with the following:

Steam Locomotives

Sand pipes to be of 1 in. extra heavy pipe.
Rate of sand delivery per sand pipe per minute:
Engine having one sand delivery per rail, 3 lb. maximum.
Engine having two sand deliveries per rail 1¼ lb. maximum.
Engine having three or more sand deliveries per rail, 1 lb. maximum.

Sand pipe or nozzle to be positioned to deliver the sand to the rail over an area 3 in. to 5 in. ahead of wheel contact with rail through to the point of contact. The delivery to be angled slightly inward to make maximum contact on the inner

half of the rail face having the protection of the wheel flange to reduce the loss.

On drivers equipped with lateral motion device, or lateral cushioning device, sand pipes should be provided with flexible arrangement so that sand pipes can follow drivers when taking curves.

Diesel Locomotives

Sand pipes to be of 1 in. extra heavy pipe.

Rate of sand delivery one pound per minute per sand pipe.

With the sand pipe or nozzle delivery position changing from that when sanding for traction in the brake release position to that when sanding during brake application with fully worn brake shoes extreme care must be exercised in the application of the sand pipe to provide effective sanding for traction and braking. The sand delivery should be into the wheel contact at rail when brakes are set and with fully worn shoes. This results in delivery over an area 3 in. to 5 in. ahead of wheel contact for traction. The high velocity obtained with the ⅝ in. or ½ in. converged nozzles results in a more effective rail conditioning and positive delivery of sand.

It was the opinion of the committee that any complaints regarding excessive sand build-up on rails will be corrected with the exercise of reasonable care regarding a fair quality of sand, preferably to the coarse side of the sieve range of the usual specification for traction sand; sand pipes or nozzles of diameter to provide a high velocity delivery; positioning of delivery nozzles to insure effective delivery of sand to point of wheel rail contact; and maintenance of sand trap adjustment to approximately the recommended delivery rates.

[The report included diagrams for recommended sand pipe location.—EDITOR]

Mounting Control Devices on Journal Boxes

A joint subcommittee has endeavored to adopt a standard method of mounting control devices on journal boxes of both locomotives and cars. In general, the method of mounting control devices on journal boxes shown on Manual page D-4C-1947 is recommended for both locomotives and cars.

The recommendations of the Locomotive Construction Committee are covered by two designs included in the report which were recommended for letter ballot as recommended practice. If approved, they will be included as recommended practice in the Manual.

Standardization of Pedestal Widths

In 1940 the committee undertook a study in an effort to provide standard pedestal arrangements for roller bearing journals for engine trucks, drivers, trailer trucks, and tenders of steam locomotives. The study was subsequently extended to include diesel-electric and electric locomotives. The committee sees no value in continuing any further work on this subject and recommends dropping the matter.

Fusion Welded Boilers

The present status of complete boilers built by the fusion welding process:

Number	Railroad	Type of loco.
1	Delaware & Hudson	2-8-0
2	Canadian Pacific	4-6-2
10	Canadian Pacific	2-8-2
1	New York Central	4-6-4
1	Delaware & Hudson	4-6-6-4
5	Chesapeake & Ohio	2-8-4
10*	Chicago, Milwaukee, St. Paul & Pacific	4-8-4
6	Chicago & North Western	4-6-4

* Seven have been installed and are in service.

In connection with welded shells, present status is as follows:

Three additional welded shells are to be constructed for the New York Central's 6000 Class 4-8-4 type locomotives. There are 27 locomotives of this class in service and when the three shells are completed and applied, all locomotives of the 6000 class will be equipped.

Also, 10 additional welded shells have been constructed and 10 additional are on order for N. Y. C. 4-6-4 type locomotives. When built and applied there will be 40 4-6-4 type locomotives on the New York Central with welded shells.

The Santa Fe has placed orders for a total of 25 welded boiler shells for application to existing boiler back ends of 4-6-4, 4-8-4 and 2-10-4 type locomotives. Sixteen of these shells have been manufactured as of January 29, 1951. Seven have been applied and five are now in the process of application. The installations to date, including those now in process, are as follows:

No. of welded shells applied	Type of locomotive
1	4-6-4
7	4-8-4
4	2-10-4

It will be noted that since the previous report, 34 additional boiler shells have been ordered.

Seal Welding of Staybolts

An item was included in the 1950 report indicating that the practice of seal welding staybolts has been sufficiently extended to warrant adoption as recommended practice. Therefore, a drawing has been prepared and it is recommended, as a letter ballot proposition, for adoption as recommended practice for inclusion in the Manual.

Axle Press Fits

The present recommended practice covering mounting pressures for driving, trailing, and engine truck axles, and crank pins, shown on pages F-129-1932 and F-130-1932 of the Manual, is not applicable to prestressed bores and rolled wheel fits. The Committee on Axle and Crank Pin Research has developed the procedure for making such fits and has included suitable mounting pressures. It is recommended, as a letter ballot proposition, that this procedure be adopted as recommended practice.

Two drawings, in the report, outline the recommendations.

Steam Locomotive Storage

Standard instructions covering the detailed procedure to be followed in placing locomotives in storage and covering their care while in storage have been obtained from 26 representative railroads. This information has been analyzed and is covered in detail in the report.

Diesel-Electric Locomotives

Recently the committee has been in contact, with the Locomotive Maintenance Officers' Association with the idea of preparing a list of practices and materials of diesel-electric locomotives that can be standardized. This organization is now preparing such a list, which will be submitted to the committee for study.

CAB ARRANGEMENT, SWITCHING LOCOMOTIVES—The locomotive builders have submitted scores of blue prints covering the cab arrangement on the different types of switching locomotives now in service. The committee feels that these prints bear out the need of arriving at a standard location for the brake valve, engine throttle, and other controls.

A questionnaire has been prepared with a diagram including proposed dimensions of pertinent details concerning the cab arrangement on diesel-electric switching locomotives. The secretary has arranged to submit this questionnaire and diagram to the regular list of 32 principal roads, to determine if it will be consistently possible to recommend standardization of the general arrangement of cab equipment.

BOLTS FOR ROLLER BEARING BOXES—Rapid dieselization has introduced many different types and sizes of journal box stud and cap bolts. Where it is necessary to remove and reapply cap screws for regular inspection and maintenance of roller bearing boxes, it has been costly and inconvenient to maintain a considerable number of wrenches of different sizes. The committee has been in contact with the manufacturers with the view of providing the least number of different kinds of cap screws consistent with journal box design.

STANDARDIZATION OF AIR BRAKE EQUIPMENT—The committee reported progress on this item. It is felt that one of the benefits of investigation will be the prevention of any additional non-standard arrangements being developed by the builders.

At present it has been agreed by the brake committee and the Locomotive Construction Committee that a joint meeting should be held with the locomotive builders and the air brake manufacturers to discuss the following:

FIRE-EXTINGUISHER EQUIPMENT—DIESEL-ELECTRIC LOCOMOTIVES

Railroad	Locomotive Service	Unit	Cab: Carbon tetrachloride qt. 1	1½	2	4	Cab: Carbon dioxide lb. 15	20	50	Cab: Dry powder lb. 20	30	Engine room or compartment: Carbon tetrachloride qt. 1	1½	2	4	Engine room or compartment: Carbon dioxide lb. 15	20	50	Engine room or compartment: Dry powder lb. 20	30
Baltimore & Ohio	Road	A	1	..	..	..	..	..	..	..	..	..	..	..	..	..	4	..	..	..
		B	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	..	..	..
Chesapeake & Ohio	Switch																			
	Present		..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..
	New		..	..	..	..	..	1	..	..	..	..	..	..	..	..	1	..	..	..
New York Central	Switch		..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	2
	Road	A	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	4
		B	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4
New York, New Haven & Hartford	Switch;																			
	Old		..	..	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..
	Old alternate		..	..	..	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..
	New		..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..
	Road:																			
	Two engines		..	..	..	..	..	..	..	..	..	..	..	..	3	..	..	1	..	..
	Road:																			
	Single engine	A	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	2	..	..
		B	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	2	..	..
	Road switch:																			
	44 ton		..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..
	1,500 hp																			
	Old		..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..
	New		..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..
Southern Pacific	Switch		..	..	..	1	..	..	..	..	..	..	..	..	1	..	..	..	..	..
	Alternate		..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..
	Road:																			
	Two engines	A	..	..	1	..	..	..	..	..	..	..	..	..	2	..	3	..	..	..
		B	..	..	..	..	..	..	..	..	..	..	..	..	2	..	4	..	..	..
	Road:																			
	Single engine	A	..	..	1	..	..	..	..	..	..	..	..	..	2	..	4	..	..	..
		B	..	..	..	..	..	..	..	..	..	..	..	..	2	..	4	..	..	..
	Road switch;																			
	44 ton		..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..
	Large		..	..	..	1	..	..	..	..	..	..	..	..	..	..	2	..	..	..
Canadian National	Switch		..	..	..	1	..	..	..	..	..	..	..	..	1	..	..	..	..	..
	Alternate		1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
	Road:	A	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..
		B	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..
St. Louis-San Francisco	Switch		..	..	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..
	Road:																			
	Two engines		..	1	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	2
	Single	A	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	2
		B	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	2
	Road switch:																			
	1,500 hp.		..	1	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..
Union Pacific	Switch		..	..	..	1	..	..	..	..	..	..	..	..	1	..	..	..	..	..
	Road:																			
	Passenger		..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	..	..	2
	Freight		..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	..	..	2
	Freight alternate		..	..	..	..	..	..	..	..	..	..	..	..	1	..	3	..	..	..
	Road switch		..	..	..	..	..	..	..	..	1	..	..	..	1	..	1	..	..	..
Atchison, Topeka & Santa Fe	Switch		..	..	..	1	..	..	..	..	..	..	..	..	1	..	..	..	..	..
	Road:																			
	Two engines		..	..	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	2
	Single engine	A	..	..	..	1	..	..	..	..	..	..	..	..	1	..	..	..	..	2
		B	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	2
Pennsylvania	Switch		..	..	..	..	..	1	..	..	..	..	..	..	..	..	1	..	..	..
	Road	A	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	4	..	1
		B	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	..	2
Chicago, Milwaukee, St. Paul & Pacific	Switch		..	..	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..
	Road	A	1	..	..	..	..	..	..	..	..	..	..	..	1	..	1	1	..	..
		B	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	1	..	..
	Road switch		..	..	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..

1. Safety control
2. Locomotive overspeed control
3. Split reduction with overspeed or safety control
4. Break-in-two protection
5. Sanding bail on automatic brake valve
6. Controlled emergency brake cylinder build-up
7. Location of parts for maintenance
8. Studs instead of cap screws
9. Dynamic interlock
10. Standard plug connectors for electropneumatic brake circuits
11. Standard hose and couplings for air connections
12. Extra heavy pipe
13. Air gages
14. Slow charging of equalizing reservoir with D24 brake valve
15. Governor synchronization
16. Radiation and cooling of compressor air
17. Angle cocks
18. Booster unit
19. Brake-cylinder gage pipe

FIRE PROTECTIVE EQUIPMENT—Investigation of fire prevention by the committee has been carried out in cooperation with the Fire Protection and Insurance Section. It is evident that the greatest fire protection available is the maintaining of general cleanliness in and about the locomotive. This problem includes oil leaks from the engines, fuel tank, steam generators and their appurtenances, and grease leakage on traction motor gear cases. Too much stress cannot be placed on the elimination of all oil leaks, and the manufacturers must always strive for the better joints at all points on the diesel engines and accessories. Better gaskets should be forthcoming with the availability of modern materials.

The cleaning of diesel locomotives, both interior and exterior, is a major problem of both maintenance and cost. The locomotive builders should make every effort to provide an arrangement that will present the smoothest contour possible, both inside and under the locomotive. This will permit easy cleaning with modern spray equipment and cleaning materials that are now available. As a result of the locomotive design, much difficulty is being encountered in using this modern spray equipment. In many cases it is necessary to perform this cleaning by hand.

Several types of fire extinguishers with their different extinguisher media are being studied in cooperation with the Fire Protection and Insurance Section. The table shows fire extinguisher equipment in use.

MOUNTING PRESSURES FOR STEEL WHEELS—It has been found desirable to provide a recommended practice to cover suitable pressure for mounting wrought steel wheels on gear driven and idler axles on locomotives. The matter was considered by a joint committee of members of the Committee on Wheels and the Committee on Locomotive Construction, and it is recommended that the table below be submitted to letter ballot as recommended practice for inclusion as new page in Section F of the Manual.

MOUNTING PRESSURES FOR WROUGHT STEEL WHEELS ON GEAR-DRIVEN AND IDLER AXLES OF LOCOMOTIVES OTHER THAN STEAM

Diameter of wheel seat (in.)	Mounting pressures (tons) Minimum	Desired	Maximum
6.000 to 6.250, inclusive	75	80	95
6.375 to 6.625, inclusive	75	85	100
6.750 to 7.000, inclusive	75	90	110
7.125 to 7.375, inclusive	75	95	115
7.500 to 7.875, inclusive	80	100	120
8.000 to 8.250, inclusive	85	105	125
8.375 to 8.625, inclusive	90	110	130
8.750 to 9.000, inclusive	90	115	140
9,125 to 9,375, inclusive	95	120	145
9.500 to 9.750, inclusive	100	125	150
9.875 to 10.125, inclusive	105	130	155
10.250 to 10.500, inclusive	110	135	160
10.625 to 10.875, inclusive	110	140	170
11.000 to 11.250, inclusive	115	145	175
11.375 to 11.625, inclusive	120	150	180
11.750 to 12.000, inclusive	125	155	185
12.125 to 12.375, inclusive	130	160	190
12.500 to 12.750, inclusive	130	165	200
12.875 to 13.250, inclusive	135	170	205
13.375 to 13.625, inclusive	140	175	210
13.750 to 14.000, inclusive	145	180	215

Desired mounting pressures are based on 13 tons per inch of diameter, expressed in the nearest 5 tons with an allowable variation of 20 per cent over and under, except the first three minimum pressure which are shown as 75 tons, being considered better practice for these sizes.

OVERHEATING OF MOTOR BEARINGS—As stated in the report last year, all known devices that will furnish any degree of protection or alarm for an overheated suspension bearing or traction motor armature shaft bearing have been considered. Experience with available thermal type alarms does not justify any recommendation on their use for this purpose at this time. The danger from an overheated traction motor armature bearing is when the rotation of the wheel is interrupted. There are three known appurtenances that can be used to give indication of the interruption of the rotation of the wheel, and some of each are on test and are being followed by the committee. It appears that some of these devices can also be utilized to give a better wheel slip control than is now afforded by present devices in common use.

The warning given in last year's report is again repeated —Railroads should make certain that all employees understand the significance of repeated wheel slip indications, and repeated ground relay actions while en route; emphasizing the need for inspection of the diesel locomotive for possible sliding of wheels when such repeated warnings are given by these devices. Such inspection must be made before the affected power plant is shut down.

The report included lengthy discussions of two broad subjects, one the combustion of coal and the other gas turbine development. The coal combustion discussion outlines a series of tests and investigations on several roads with the idea of recording the relation of steam locomotive devices and their application to the efficiency of fuel combustion and gave the results of tests run by the Standard Stoker Company and the Pittsburgh Coal Company.

The discussion of gas turbines was in the nature of progress reports on the General Electric, Westinghouse and Baldwin-Lima-Hamilton locomotives and the coal-burning gas-turbine development of the Bituminous Coal Research group. Most of the information in this section of the report is already a matter of record.

The members of the committee were A. G. Hoppe (chairman), engineer research and development, Milwaukee.

Steam and Electric Locomotive Section: C. H. Knowlton (vice-chairman), assistant engineer equipment, New York Central; H. C. Wright, general superintendent motive power, Pennsylvania; G. M. Harding, assistant chief mechanical engineer, Canadian National; H. H. Lanning; and J. L. Ryan, mechanical engineer, Frisco.

Diesel Locomotive Section: G. F. Wiles (vice-chairman), supervisor diesel-electric locomotive operation, Baltimore & Ohio; K. Cartwright, general mechanical superintendent, New Haven; H. V. Gill, superintendent shops, Santa Fe; F. Thomas, assistant to general superintendent equipment, diesel and electric, New York Central; and D. R. Calleri, mechanical engineer, Southern Pacific.

Gas Turbine Locomotive Section: H. C. Wyatt (vice-chairman), assistant general superintendent motive power, Norfolk & Western; E. R. Hauer, assistant superintendent motive power, engineering, mechanical, Chesapeake & Ohio; J. L. Caver, mechanical and research engineer, Illinois Central; H. Rees, mechanical engineer, Union Pacific; and F. H. Einwaechter, chief engineer, motive power and equipment, Baltimore & Ohio.

The report was (with one amendment) accepted and referred to letter ballot.

Specifications for Materials

The committee made recommendations on the following specification changes:

M-101 (carbon-steel axles, as forged) to increase the permissible run out of the center of the axle from ¼ in. to ⅜ in. as an emergency measure, and two other changes to be submitted to letter ballot.

M-105 (blooms, billets and slabs for forgings) to be separated by the committee during the coming year into two specifications, M-105 to cover carbon steel and M-131 to cover alloy steel.

M-106 (steel tires, locomotives and cars) to conform to present commercial practice.

M-107 (multiple-wear wrought carbon-steel wheels) to meet changed conditions of service and present mill heat-present commercial practice.

M-108 (boiler tubes) deleted because product covered is no longer made.

M-110 (rivet steel and rivets) editorial changes.

M-111 (pipe for special purposes) and M-114 (carbon-steel helical springs) to be consistent with commercial practices.

M-115 (boiler and firebox steel) is under consideration for revision to decide if the copper restriction should be deleted from the base specifications and included as a supplementary requirement.

M-118 (coupler knuckle pivot and swivel pins) to meet currently accepted standard practices and to avoid paying extra for special chemical requirements.

M-120 (journal-box lids) to include specifications for 6½ in. by 12-in. journal-box lids.

M-124 (heat-treated steel tires) and M-130 (pipe for ordinary uses) to meet present commercial practice.

M-403 (malleable iron castings) to include three changes in identification marks.

M-502 (relined journal bearings) to set up the same tolerances for new and relined bearings, thus requiring only one set of inspection gages.

M-601 (air-brake and train-air-signal hose), M-603 (cutting and welding hose), M-605 (steam and hot-water hose), and M-608 (air-pneumatic tool hose) to permit the use of synthetic rubber.

M-904 (renovated car oil), M-905 (new waste for journal-box packing), M-906 (new car oil), and M-910 (renovated journal-box packing) as emergency specifications to supersede present A.A.R. specifications until the research now being conducted is completed in order to keep hot boxes at a minimum.

M-911 (bristle, hair, fiber and wire brushes) and M-195 (nylon filament brushes)—a revision is under consideration as an emergency specification.

M-916 (car and locomotive sand) to include new specifications for car and locomotive sand.

The above changes, with the exception of emergency measures and editorial revisions, were recommended for submission to letter ballot.

General

A study of diesel crankcase lubricants and fuel proposed in the 1950 report was considered at a meeting of the Committee on Research, and it was decided that the subject should be progressed.

The proposal in the 1950 report that requirements for winter thinner or cut-back oil for journal boxes he added to M-906-New Car Oil was rejected in favor of formulating new specifications covering suitable oil for this purpose. This was assigned to a subcommittee which submitted a draft of specifications to the

major oil refineries to solicit comments and suggestions. The replies indicated that the specifications submitted would greatly limit the source for such an oil.

The proposed specifications were submitted to J. R. Jackson for review on the basis of facts developed at the Indianapolis laboratory. Tests there indicated that no appreciable benefit is derived from mixing cutback oils with ordinary renovated oil to prevent journal-box packing from rolling or being displaced on starts in subzero weather, and that blending oils and procedure requiring technical control should be done in a properly equipped and supervised blending plant.

It was suggested that, before any specifications for cold-weather journal swabbing oil are adopted, samples of the proposed oils be sent to the Indianapolis laboratory for comparative tests under extreme subzero temperature conditions. These particular tests will include other materials besides the oils mentioned, such as isopropyl alcohol, distillate fuel oil and kerosene. While these materials are prohibited under present A.A.R. rules it is believed that their effectiveness as swabbing material should be established for judicious use as they appear to be the only effective treatment under extreme subzero operating conditions.

Members of the committee are W. F. Collins (chairman), engineer of tests, New York Central; P. H. Smith (vice-chairman), engineer of tests, Burlington; H. G. Burnham, engineer of tests, Northern Pacific; M. A. Pinney, engineer of tests, Pennsylvania; Frank Fahland, research and standards engineer, Union Pacific; R. W. Seniff, engineer of tests, Baltimore & Ohio; E. B. Fields, engineer of tests, Santa Fe; R. McBrian, engineer standards and research, Denver & Rio Grande Western; L. S. Crane, engineer of tests, Southern; G. E. Baumgardner, assistant research engineer, Norfolk & Western; V. C. Barth, chief chemist, Chicago & North Western.

Discussion

It was asked if the A.A.R. has any provisions for remedying cold-weather starting during the interim period while a cold-weather journal-box oil is being developed. The answer was that tests have shown that thinner oil does no good—the original characteristics of the oil were retained. The packing rolled even when the oil was cut with kerosene. The tests were made without packing retainers.

Tests run by a railroad at from 35 to 50 below showed that retainers would reduce but not eliminate rolling.

One member pointed out that on the Northern Pacific the hot-box problem is at its worst in July and August.

Since the report was printed two requests for cerificates of approval have been received for 6½-in. by 11-in. journal-box lids.

(*The report was accepted and referred to letter ballot.*)

Arbitration

During the year Cases 1834 to 1836, inclusive, have been decided and copies forwarded to the members.

The following principal changes are recommended:

With the concurrence of the Committee on Couplers and Draft Gears, modification of the third note following Paragraph (d-1) of Rule 3 to provide specific reference to short draft gears approved for cars of special construction.

With the concurrence of the Car Construction Committee, modification of Paragraph (r-1) of Rule 3, to indicate that means of holding sliding type doors on refrigerator cars open is not required.

Modification of Paragraph (k-2) of Rule 4, to indicate that road issuing defect card may, at its own discretion, also issue additional defect card for unconcealed associated unfair usage defects when so requested by car owner.

With the concurrence of the Wheels Committee, modification of Rules 9, 10, 70, 82, 98 and 101 to establish a more equitable basis for charges and credits for one-wear wrought-steel wheels reclaimed by turning, and to avoid the necessity for following such wheels through the wheel shops to complete billing transactions.

Elimination of last paragraph and note following of Rule 16, to make the testing of safety valves on tank cars unnecessary by member roads.

With the concurrence of the Tank Car Committee, modification of Interpretation No. 1 of Rule 16, to insure proper patching of tanks of tank cars.

Modification of Notes 2 and 3 following Section (e) of Rule 17, to provide car owner proper protection for sliding chair castings when A.A.R. Standard No. 18 beams are applied.

Elimination of first notes following Sections (g) and (1), and the addition of new note following Rule 60; and modification of Paragraph (j-2) of Passenger Rule 7, to indicate definite requirements in connection with periodic attention to air brakes and to provide reference to air-brake pamphlets governing such work.

With the concurrence of the Lubrication Committee, elimination of note following present Section (k) and addition of new Section (k) of Rule 66-A, to indicate types of greases approved for lubrication of journal roller bearings; also modification of the last paragraph of Rule 85 to provide a one-month period of grace whereby handling line can return cars equipped with journal roller bearings to the owner in order to avoid responsibility for failure because of lubrication date being overdue.

Modification of Paragraph (1-b-3) of Section A of Rule 112, to clarify the intent with respect to transportation charges on damaged cars returned to owner.

Addition of new note following Section (h) of Passenger Rule 2 to expedite the installation of A.A.R. Standard passenger car axles to passenger equipment cars.

The committee did not feel that any of the modifications included in its report necessitated submission to letter ballot.

Members of the committee are J. A. Deppe (chairman), superintendent car department, Milwaukee; W. N. Messimer (vice-chairman), general superintendent of equipment, Merchants Despatch Transportation Corporation; H. M. Wood, assistant chief of motive power (car), Pennsylvania; R. M. Smith, vice-president, Union Tank Car Company; R. E. Baker, assistant general manager (mechanical), Boston & Maine; R. D. Bryan, mechanical assistant, Santa Fe; A. H. Gaebler, superintendent car department, General American Transportation Corporation; E. P. Stemshorn, assistant chief of car equipment, Canadian National.

(*The report was accepted.*)

Couplers and Draft Gears

Couplers

Shank Wear Plates.—Proposed regulations covering the application of wear plates on coupler shanks, recommended by the Mechanical Committee of the Standard Coupler Manufacturers, have been approved by the committee as a letter ballot item.

Diesel Coupler Standardization.—The committee found more than 80 different coupler designs on diesel locomotives. Slight variations in the designs effectively prevented inter-changing couplers and because of the resulting maintenance problems and high cost the committee recommends that eleven designs, Fig. 1, selected by various railroads and the coupler manufacturers be submitted to letter ballot for adoption as alternate standards. The eleven designs were selected because they seem to meet the main differences in underframe designs of the locomotive builders. The committee believes new diesel locomotives should be designed to use only these alternate standards. Approval of the recommendation will not prevent the continued use and replacement in kind of all existing couplers on locomotives now in service.

Coupler Specifications Revisions.—The revisions of Specifications M-204-49 and M-206-49 covering the purchase and acceptance of Types E and H Couplers, respectively, are recommended as letter ballot items. The revisions, included as Exhibits B and C of the report, make the specifications consistent with the recommended welding procedure for high tensile steel castings as it affects coupler castings.

Coupler Reclamation (Types D and E).—With a decision made on the welding of high tensile steel castings the committee recommends, as a letter ballot item, the revision to Pages C-66 to C-72, inclusive of Appendix A, Section C of the Manual to incorporate provisions for reclaiming high tensile steel Type E coupler bodies. The proposed revisions were included as Exhibit D of the report.

Improved Coupler Operating Rod.—An improved coupler oper-

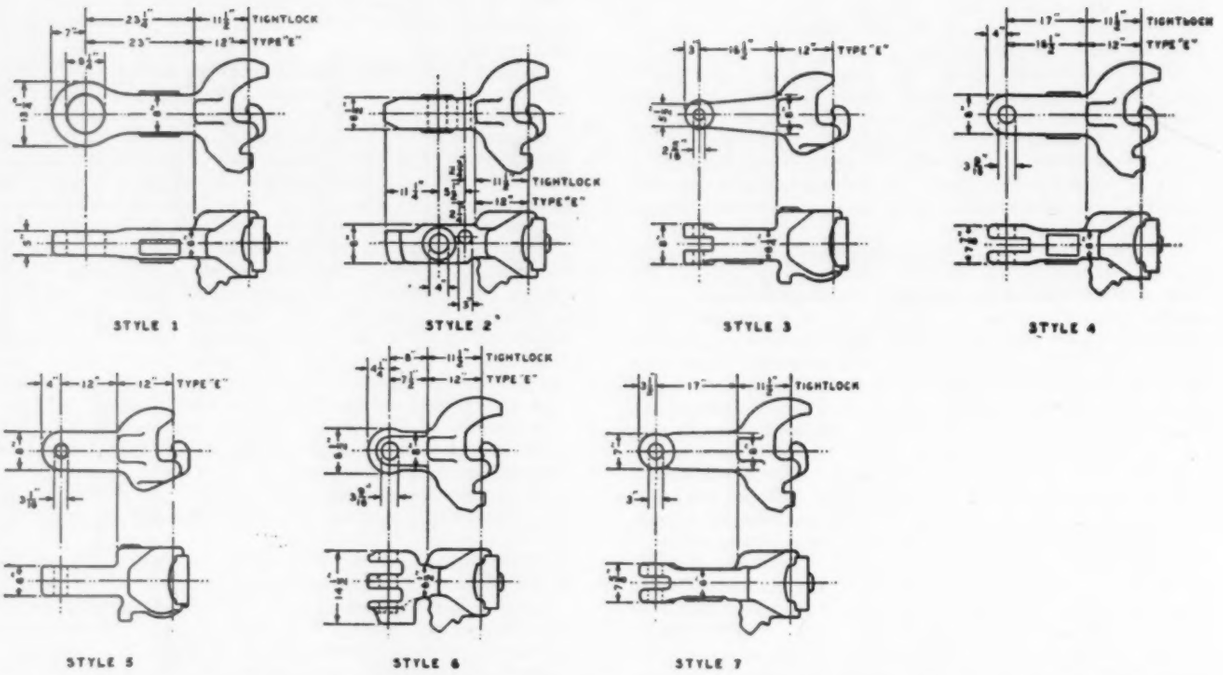


Fig. 1—Eleven coupler designs selected as alternate standards for diesel locomotives. Note that four of the styles show dimensions for both tightlock and Type E couplers.

ating rod developed by the Standard Railway Equipment Manufacturing Company, is suitable for use with either the Type E coupler or the Type F interlocking coupler on freight cars. The rod is the same as the present standard rod except that the lower portion of the handle has an inwardly extended hand grip. Maximum leverage is obtained and the handle is in a better position to fully open the knuckle. The committee, with the concurrence of the Mechanical Committee of the Standard Coupler Manufacturers, recommends letter ballot approval of this item as an alternate standard.

Pitt Type Coupler.—Due to failures in service and inherent weakness of design the committee recommends, as a letter ballot item, that the Interchange Rules be revised to include the rule that cars equipped with Pitt type couplers shall not be acceptable in interchange after January 1, 1955.

Type F Interlocking Coupler.—Ten cars were equipped with Type F interlocking couplers for freight equipment during the past year. Their performance in eight months of service was entirely satisfactory; the same is true of six cars sets in service for approximately three years. An additional 43 cars are now being equipped with Type F Couplers. Because of the satisfactory record the committee has authorized an increase in trial service applications from 250 to 5,000 car sets. A new circular No. 5550 describing and illustrating the important features and advantages of the Type F coupler may be obtained from any of the standard coupler manufacturers.

Standard H Tightlock Coupler.—Because the outstanding advantages of the Standard H tightlock coupler are widely recognized the committee recommends for letter ballot that this coupler be made mandatory for all passenger equipment cars built new on or after January 1, 1953.

An improvement in the design of the guard of this coupler to resist vertical distortion has been approved for incorporation in the manufacturers' equipment as soon as practicable. Also, as a result of the vertical distortion occurring with tightlock couplers it was apparent that the vertical distance between the guard arm and the aligning wing pocket opening should be increased. A change in the manufacturers' drawbar face and contour gage No. 31707 has been approved to provide a ⅛-in. minimum difference between the gage dimensions and the corresponding opening in the wing pocket.

Undesired emergency brake applications in freight trains hauled by diesel locomotives equipped with tightlock couplers have been caused by interference of the lower interlocking lug on the aligning wing pocket with the air hose on the freight car. To eliminate this condition instructions have been issued to the members on the procedure and details for modifying new and existing Type H couplers. The modifications to existing Type H couplers are shown in Fig. 2. Manufacturers have been authorized to incorporate the changes in new coupler production as soon as practicable.

Standard Yoke Tolerances.—To establish uniformly consistent control of the important dimensions of standard yokes the Mechanical Committee of the Standard Coupler Manufacturers proposed that tolerances be shown on the yoke drawings in the Manual. New drawings to replace those shown on Pages C-38-A to C-38-D were included in the report and will be shown in the manual. Plate 321 in the Supplement to the Manual shows an obsolete design of the Grade B steel Y-40 yoke and the committee recommends its deletion.

Derailments of Cars Equipped with Swivel Shank or Swivel Butt Couplers.—The special subcommittee has completed its report covering the results of its studies of derailments on the Pennsylvania of empty cars equipped with swivel shank couplers and swivel yokes, or with swivel shank couplers with swivel butts and Farlow two-key yokes, when the cars are used in heavy pusher service. After thoroughly reviewing and discussing the results of extensive tests conducted by the committee and supplemental tests conducted by the Pennsylvania the committee recommends the elimination of the swivel butt coupler with horizontal yoke and two keys as an alternate standard. This action will involve the elimination of the swivel butt casting No. Y-20 from Page C-32-A of the Manual. It is recommended for approval by letter ballot, effective December 31, 1951.

Draft Gears

Certified Draft Gears.—A certificate of approval was granted during the past year to a gear submitted by the American Steel Foundries but to be designated as the Peerless Quad type draft gear and sold by the Peerless Equipment Company. A rubber draft gear known as the National Type M-260, submitted by the National Malleable and Steel Castings Company, is now being tested to the new tentative specifications for rubber draft gears for freight service.

Short Draft Gears.—The short draft gears for cars of special

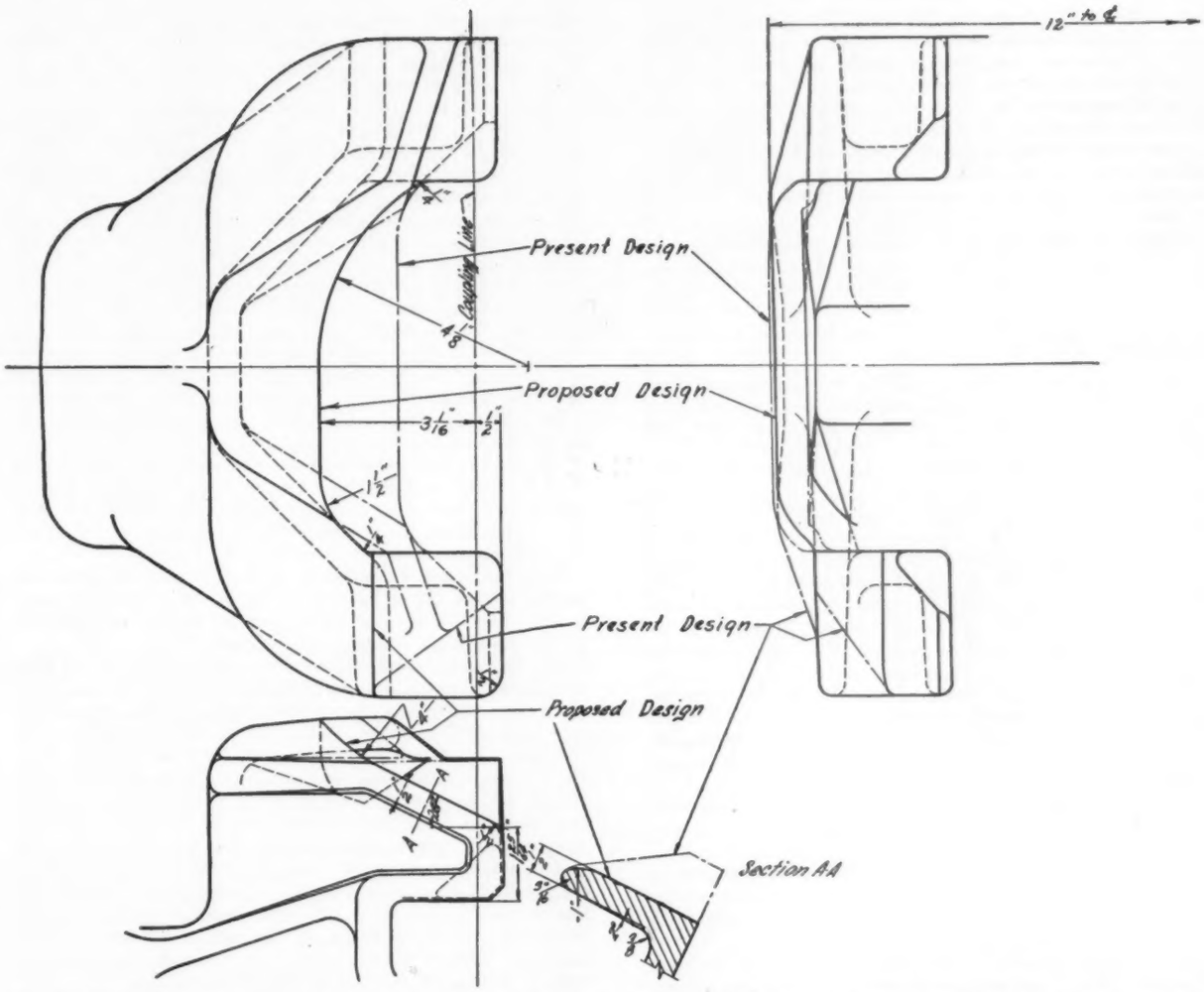


Fig. 2—Modifications to be made to existing Type H tightlock couplers to eliminate interference with air brake hose and the resulting emergency brake applications. These brake applications have been reported in freight trains hauled by diesel locomotives equipped with tightlock couplers.

construction approved to date are: Miner A-69-XB, Miner A-100-D, Cardwell V-18 and Cardwell L-11-S.

Check Tests of Certified Canadian Gears.—The tests of this group of gears have been completed and the results supplied to the manufacturers and the Canadian member roads.

Check Tests After Service.—Check tests of certified draft gears after 5 and 12 years of service have been completed except for the National M-50-B gear, specimens of which have not yet been found.

Waugh Twin-Cushion Tests.—Four specimens of the Waugh Twin-Cushion Type WM-4-6 gear, made of synthetic rubber, were tested after five years of service with an average of 134,000 miles of service. The gears were found in good condition and their capacity and performance were practically the same as when tested new, prior to application.

Waugh Twin-Cushion Type-4-6R Gear.—The application of 500 cars sets of this gear has been authorized for experimental service. It is a modification of the Waughmat Twin-Cushion Type WM-4-6 with a yoke designed for use with rigid shank couplers.

Check Tests of Conditional Gears.—Three conditionally approved gears, the Miner A-22-XL, Hulson 202 and the Waugh-Gould 420, have had two years of service in substantial numbers. Arrangements are being made for check tests and if results are satisfactory gears will be eligible for unconditional approval.

Draft Gear Reaction Measurements.—To find a better and simpler method of measuring draft gear reaction, extensive tests have been made at the A.A.R. Laboratory, Purdue University. Tests have been made on eight types of gears using SR-4 strain gages, a cathode ray oscillograph and a rotating drum camera, as well as the standard chronograph. Before it can be determined that the oscillograph records have practical value it is believed that impact tests will have to be made and such tests are under consideration.

Specifications for Rubber Draft Gears.—Tentative specifications covering draft gears of the rubber cushion type, included in the report, were submitted by the committee but they are not recommended for adoption as standard at this time. The tentative specifications are the same as those established for metallic type gears. (Specifications M-901) except for modifications necessary to make them applicable to rubber gears.

The members of the committee are H. W. Faus, (Chairman), engineer, locomotive equipment, N. Y. C.; C. K. Steins (vice-chairman), mechanical engineer, P. R. R.; F. T. James, general superintendent motive power and equipment, D., L. & W.; B. Faughnan, assistant works manager Angus shops, Can. Pac., J. W. Hawthorne, general superintendent motive power and equipment, A. C. L.; I. N. Moseley, research and test engineer, N. & W.; A. W. Maydahl, engineer car maintenance, U. P.; A. B. Lawson, mechanical engineer, B. & O., and N. A. Passur, engineer car construction, S. P.

Discussion

Several members commented at length, concerning the difficulties that many roads are having with trains breaking in two

due to the malfunctioning of the uncoupling rigging on certain types of bottom-operated couplers in both freight and passenger service. Those who discussed the subject presented the details of conditions surrounding several specific cases and the results of investigations that had been made to determine the causes. While recommendations were not made as to the manner of correcting the difficulties the general opinion was that the committee should instigate a study of the entire situation both with respect to possible changes in uncoupling arrangements and the effects of wear of coupler and rigging parts.

(*The report was accepted and referred to letter ballot.*)

Loading Rules

The first part of this report included general statements concerning the work of the committee with respect to loading military equipment, and in connection with the publications of the rules in pamphlet form.

With the opening of hostilities in Korea, the Army-Navy Special Supplement No. 1, covering the loading of mechanized and motorized equipment and major caliber guns, accompanied by and under direct supervision of military personnel, was reissued October 1950, at the request of the railroads and the Department of Defense. The Army-Navy Special Supplement No. 2, covering the loading of military vehicles and major caliber guns not transported in complete trains or accompanied by department of defense personnel, was issued in January 1951. This supplement, which was revised in joint agreement with the Loading Rules Committee of the Military Traffic Service, Department of Defense, contains figures and specifications for all new equipment which has been brought to the attention of the Loading Rules Committee.

Sponsored by the Military Traffic Service of the Department of Defense and conducted jointly by the Departments of the Army, Navy, and Air Force and the A.A.R., a series of three-day seminars on sound loading and bracing methods to prevent loss or damage to vital equipment and war material, have just recently been completed. The seminars were developed by the Loading Rules Committee of the Military Traffic Service under the chairmanship of Francis X. Dunleavy, assistant deputy director of military traffic service, in coordination with the A.A.R.

At the request of the Ordnance Department of the U. S. Army, a member of the Loading Rules Committee and representative of the Freight Loading and Container Section of the A.A.R. made visits to the Rossford Ordnance Depot, Toledo, Ohio, to present a program on open and closed car loading at their school on packaging, bracing and blocking. This matter has now been delegated to two representatives of the depot who were given instructions on both open and closed carloading by members of the committee and the Freight Loading and Container Section.

As stated at the 1950 meeting, all publications of the Loading Rules will be in pamphlet form. The following pamphlets have been issued to date: Grading and Road Making Machinery; Steel Products, excluding Pipe; Machinery; Pipe; and Miscellaneous Commodities.

All forest products have been included in a separate pamphlet recently issued by the Special Committee on Forest Products Loading.

Difficulties experienced on shipments of tractors, particularly the cross-wise loading method, has resulted in recommendations for improvements in methods for loading tractors. These recommendations have now been sent to the Farm Equipment Institute for concurrence and will be included in the pamphlet covering Farm Equipment Machinery, if approved. The balance of the figures to be included in this pamphlet are now being prepared by the subcommittee. Several joint meetings have been held with the Farm Equipment Institute to progress the preparation of the specifications and drawings of the farm machinery to be included in this pamphlet. It is expected that the approved figures can be selected at the next joint meeting and placed in line for publication, which will complete the division of the present Loading Rules in pamphlet form.

The detailed recommendations in the report consisted of (1) completed items scheduled for early inclusion in the rules and (2) subjects still under consideration. The first group of items concerned revisions of rule 15 and Figs. 8-A, MD-1; 45, MD-1; 45A, MD-1; 171 and 172A, which changes were made at the request of shippers, while changes were made in Figs. 12, MD-1; 30, MD-1 and 44, MD-1 to clarify the intent of the rule. A new paragraph was added to Fig. 60, MD-1 concerning turntables more than 50 ft. in length to provide for greater safety.

In the second group there are approximately 17 subjects still under consideration, some of which will require only revision in the present specifications and figures, while others will require the formulation of new specifications and figures to cover. The subjects embrace nine on steel products (coils; plates; sheets; slabs; tanks) two on farm machinery (preparation of farm equipment machinery pamphlet; tractors); four on stone and clay products; (stone; marble; pouring channels; sewer pipe); one on machinery (cranes) and one on Army-Navy material (engines).

Inspections have been made and experimental shipments are being forwarded, and other experimental tests considered, on loading methods for steel products, the results of which will determine their inclusion in the rules.

Progress has been reported by the subcommittees on the loading methods under consideration for stone, sewer pipe, pouring channels and cranes, all of which require inspection at the shippers' plants. These inspections are now being held, and the loading methods progressed for inclusion in the rules.

The experimental shipments of jet engines in metal containers, cradled and secured on flat cars, having proved satisfactory, specifications and drawings are being prepared by the subcommittee for inclusion in the Army-Navy Supplement No. 2.

The members of the Loading Rules Committee are: W. B. Moir (chairman) chief car inspector, Pennsylvania; H. H. Golden (vice-chairman), supervisor A.A.R. interchange and accounting, Louisville & Nashville; T. W. Carr, assistant to superintendent of equipment, Pittsburgh & Lake Erie; A. H. Keys, superintendent car department, Baltimore & Ohio; H. S. Keppelman, superintendent car department, Reading; F. A. Shoulty, assistant superintendent car department, Milwaukee; H. J. Oliver, assistant superintendent motive power, Detroit, Toledo & Ironton; G. R. Andersen, superintendent car department, Chicago & North Western; H. L. Hewing, superintendent of interchange, Chicago Car Interchange Bureau; N. A. Williams, assistant engineer freight car design, Union Pacific; L. F. Delventhal, Jr., transportation inspector, Western Pacific; and J. H. Campbell, supervisor of loading, Mechanical Division, A.A.R.

Forest Products Loading

Since the last meeting, the Special Committee on Lumber Loading has been renamed the Special Committee on Forest Products Loading. Due to the apparent necessity of including in the rules a figure to cover an economical method of loading lumber, new Fig. 6-C has been formulated. This figure covers the loading of packaged or bundled lumber 10 ft. to 16 ft. in length on flat or gondola cars and employs the best features of the various methods submitted to the committee by the shippers. It was felt that shipments loaded under this figure would materially decrease the present number of disarranged packaged lumber loads.

The following changes were approved for inclusion in the rules:

(1) The use of common wire of other gages for that specified, provided they are of equivalent load strength. This change was approved because of the present scarcity of No. 9 gage common annealed wire.

(2) The permission to load vertical pieces to a height of 5 ft. 6 in. above top of car sides in Fig. 22, to permit shippers to load 10 ft. ties vertically in gondola cars with 54 in. sides.

(3) The clarification of the second sentence of the paragraph covering gondola cars for Item B of Fig. 26 as follows: "Not required when logs in top layer adjacent to car sides extend ⅓ or more below top of car sides, and when logs between those against car sides extend 4 in. or more below top of car sides or ends."

These changes and new Fig. 6-C were included in the new Forest Products Pamphlet which has now been issued as No. MD-3, and covers the loading of all forest products.

The members of this committee, in addition to the personnel of the Loading Rules Committee, are: F. A. Shoulty (chairman), assistant superintendent car department, Milwaukee; F. G. Moody

(vice-chairman), superintendent car department, Northern Pacific; G. J. Lehnerer, superintendent car department, Illinois Central; and L. E. Day, district master car repairer, Southern Pacific.

Discussion

Harry D. Fenske, assistant vice-president, Great Lakes Steel Corporation, a unit of the National Steel Corporation, in commenting on the close cooperation which exists between the Committee on Loading Rules of the Mechanical Division and the various groups of shippers, said that in these highly competitive times in the transportation field such cooperation was an important accomplishment. He urged that it be extended even further. The great need to be filled, he said, is a better way to get freight to and from the place where the shipper wants it before and after it is moved in trainload lots. Mechanical officers, he thought, had much to contribute in the development of types of equipment most likely to meet this need. An effective method of making special types of cars for special lading carry revenue loads in every direction has not yet been found. This he presented as one of the problems in which cooperative effort might prove effective.

(The report was accepted.)

Wheels

The introduction to this report outlined the changes in the Wheel and Axle Manual and included in the new printing dated February 1951 and now available. A modification of Paragraph 305 of this new manual has been made, as follows: "New unmounted wheels with ground treads should have the final tape size, measured after grinding, preceded by the letter G, stenciled with white lead paint on front and back of plate, and the tape markings cast on the wheel chipped to show the original as-cast tape size."

In this connection recommendation was made to the Committee on Specifications for Materials that Section 6 (d) of Specifications M-403 be revised to coincide with Paragraph 305 of the Wheel and Axle Manual.

The committee recommended certain changes in Par. 5, Sec. 4, Specification M-403.

Recommendations were made, as a letter ballot item, that designs for cast iron wheels, Manual page G-2A-1950 for Axle B and G-2B-1950 for Axles C to E inclusive, be advanced from "Recommended Practice" to "Standard."

It was also recommended, as a letter ballot item, that the nominal weight of 850-lb. single plate bracketed cast iron wheel (cored hub and alternate solid hub designs) shown on page G-2B-1950 of the Manual be reduced to 835 lb. without change in dimensions and, if adopted, necessary corrections be made in A.A.R. Specifications M-403—Cast Iron Wheels.

Cast Iron Wheel Failures

As information, data concerning cast iron wheel failures reported to the Interstate Commerce Commission for the average of five years previous to 1950, and the year 1949, compared with 1950 where damage was over $275 showed the following:

1945-49, incl. (Avg.)	Total	Flange	Plate	Rim
1949	281	175	59	47
1950	174	140	30	4
Year	220	170	37	13

Specifications M-103 and M-107

Due to the fact these specifications do not contain sufficient specific information with respect to standard and temporary standard designs of wrought steel wheels, the committee requested the committee on Specifications for Materials to modify Sections 2—Design of Specifications M-103 and M-107 to read as follows: "2. Design—Standard and temporary standard designs and tread and flange contours for wrought steel wheels shall be as shown in Section G—Wheels in the A.A.R. Manual to Standard and Recommended Practice. Application for approval of designs not shown in Section G shall be addressed to the Secretary of the A.A.R., Mechanical Division for submittal to the Joint Subcommittee on Wrought Steel Wheel Design."

Suggestions were contained in the 1950 report for modification and additions in Sections 1 (b), 7, and 10 (c4). These suggestions were referred to the Committee on Specifications for Materials, which agreed to make the necessary changes with one exception and offered a further recommendation to modify Section 10 (c1) of Specifications M-107, as follows: *Proposed Form*—(c) Number of Tests.—(1) *Where continuous heat treating furnaces are used,* Brinell hardness measurements shall be made on 10 per cent of the wheels from each heat. *Where batch type heat treating furnaces are used, Brinell hardness measurements shall be made on 10 per cent of the wheels from each heat treatment lot, provided that at least one wheel is selected for test from each heat represented in the heat treatment lot.*

The committee also recommended that Section 10 (c4) of Specifications M-107 be modified and in view of the deletion of the gages for rolled to finish multiple wear wrought steel wheels from the A.A.R. Manual due to this type wheel being no longer manufactured, the committee concurred in a recommendation to modify Section 14 (a) of Specification M-107.

Suggested Changes in Pages G-21 to G-26

The preface shown on these pages in Manual Section G is no longer correct due to revisions and changed conditions. Such corrections as are necessary will be made and included in the next set of revised Manual pages. The outstanding change being made in these pages is the deletion of the old WPB designations for the various designs.

Redesign of AX-36

It was recommended, as a letter ballot item, that Design AX-36 wrought steel wheel be changed by increasing the hub diameter dimensions from the present 9½ in. to 9¾ in.

Restoring Design DX-40

It was recommended, as a letter ballot item, that previous temporary standard design DX-40 engine truck wheel, formerly shown on Manual page 151, be re-established.

The 40-in. Diesel Wheel

A recommendation was approved that a design of 40-in. diameter diesel locomotive wrought steel wheel, similar to the A-40 design except dimension G (rim thickness) changed from 2½ in. to 1¾ in., be permitted for manufacture and use not as an alternate standard but designated EXP-40 and considered as experimental until sufficient data are obtained to justify standardization.

Questionnaire on Steel Wheel Failures

On one railroad thermal cracking was a serious problem. The use of Class A wheels exclusively in this service resulted in a reduction in removal of wheels for thermal cracking from 65 per cent to approximately two per cent of the wheels in service. The experience of this road emphasizes the importance of the scope clause in Specifications M-107, which designates the classes of wheels for various classes of service and in which it is specified that for high speed service with severe tread braking conditions and moderate wheel loads, the use of Class A wheels is very beneficial.

The answers to questionnaire on thermal cracking on diesel and passenger wheels should be available by the fall of 1951.

Marking Diesel Wheels

Due to the desire of some roads to eliminate markings entirely from rims of diesel wheels, it was necessary to prepare an alternate method for marking on face of the hub of these wheels. This was shown as Fig. 2, in Appendix A and it was recommended, as a letter ballot item, that this alternate method be adopted and included in Specifications M-107.

Marking Requirements

The committee considered the possibility of simplifying marking of wrought steel wheels other than the six diesel designs. In the interest of standardization and facilitating production, a suggestion was made that the same size of dies for hot stamping char-

acters as are mandatory for the six locomotive designs be used. In accordance with this suggestion it was decided to correct Specifications M-103 and M-107.

Axle Capacity Ratings

It is recommended, as a letter ballot item, that the 1928 standard freight car axle (Fig. 8, Wheel and Axle Manual) when used in BX service, be rated in accordance with the following table and, if adopted, included in the next Supplement to the Wheel and Axle Manual.

CAPACITY OF AXLES UNDER CARS IN BX SERVICE

		Capacity in Lb. for Axles for Normal Operating Speed Ranges (Based on 72-in. Center of Gravity and 33-in. Wheels)			
			Up to 85 m.p.h.		86 to 100 m.p.h.
A.A.R. axle designation	Size of journal in.	Std. pass. A.A.R. 1940 axle	A.A.R. 1928* std. frt. axle	Std. pass. A.A.R. 1940 axle	A.A.R. 1928* std. frt. axle
C	5 x 9	32,000	19,500	30,500	18,500
D	5½ x 10	40,000	23,500	38,000	22,500
E	6 x 11	50,000	30,000	47,500	28,500

Ultrasonic Inspection of Axles

An ultrasonic reflectoscope has been used on driving axles, crank pins and billets to check for defects which could not ordinarily be found by magnetic particle testing or common visual inspection. Five railroads are investigating this type of inspection and it is felt that under the present state of development the instrument cannot be considered as a general shop inspection tool due to the special skill which is required for interpreting results. The committee does not consider this method of inspection as an alternate to magnetic particle testing of axles but in the future it may be used for inspection of diesel axles at points where magnetic particle testing cannot be used.

Special Cars for Transporting Wheels

In the 1950 report attention was directed to the necessity for providing a sufficient number of special cars for the transportation of mounted wheels in an effort to reduce the number of damaged wheels and axles, particularly nicked axles occurring in transit.

Under existing high cost of labor and material in mounted wheel assemblies and in some cases included mounted roller bearings, it is of considerable importance that the safe transportation of this equipment to destination be secure. Nicking of axles means a complete loss of the accumulated labor cost, in addition to transportation costs, and frequently the axle is a total loss, which is considerably higher on normalized and tempered axles employed on roller bearing assemblies. It was urged that all roads give serious attention to special cars and that all roads provide a sufficient number of such special wheel cars to obviate the use of revenue flat and gondola cars.

The wheel committee reviewed, approved and referred to the Arbitration Committee certain changes in Rule 98 (i) pertaining to charges and credits for one-wear wrought steel wheels reclaimed by turning. Also, changes were proposed for revision of condemning limits, affecting Rules 71 to 82 inclusive and Rule 86 which will be further investigated and recommendations made.

Wheel Gages

Recommendation included in the 1950 report to revise the limits for condemning cast iron wheels of 80,000 lb. capacity and over, was approved by letter ballot. This action involved modifications of gages shown in the Wheel and Axle Manual, Interchange Rules and Section B of the Manual of Standard and Recommended Practice. Necessary changes have been made on Manual pages B-45, B-83, B-108, B-47, B-98, B-109 and included in the latest Manual revision.

Recommendation also was made in the 1950 report that gages for roll finished wrought steel wheels and tires, shown on Manual pages B-42I, B-42J, B-96, B-97 and B-113, be eliminated, this type of wheel being no longer furnished by the manufacturers. This recommendation was approved by letter ballot and the pages involved eliminated from the latest issue of the Manual of Standard and Recommended Practice.

A recommendation was included in the 1950 report to provide separate gages for new one wear wrought steel wheels. The recommendation was approved by letter ballot and designs for these gages to include manufacturing tolerances, were prepared for inclusion in the Manual of Standard and Recommended Practice together with new master gage and wear limit condemning gage designs. These designs are shown on Manual pages B-42I, B-42J, B-96, B-96A, B-96B, B-97, B-112B and B-113. This action also necessitated the deletion of reference "one wear wrought" from Manual pages B-41, B-42A, B-99, B-100, B-101, B-102 and B-114.

It has been found that the standard steel wheel gage, Fig. 122 of the Wheel and Axle Manual, does not condemn high flanges at 1½ inch, due to the fact that the movable finger when set for high flange, Fig. 128, condemns flange at $1\frac{35}{64}$ in. high. This will require a modification in design which is being progressed.

A simplified design of gage has been developed by some roads for gaging steel wheels to determine whether they are condemnable for high flange or thin rim. This gage can be used in place of the regular steel wheel gage, Fig. 122 of the Wheel and Axle Manual, for this purpose, the latter gage being more complicated and more expensive to furnish.

In the interest of economy and simplification, the committee recommended the use of a simplified gage of this type for roads desiring to use it. Drawings illustrating designs of this gage were shown in the report. This simplified gage is not intended to replace the standard steel wheel gage, which is necessary for use by forces whose duties require the measurements of service metal in terms of sixteenths of an inch on wrought steel wheels.

Wheel and Axle Manual Changes

Recommendation is made, as a letter ballot item, that the following changes in Section XX of the Wheel and Axle Manual be adopted and, if approved, included in the next Supplement:

1. Revise third paragraph of Rule 354 (i), as follows: *Proposed Form—When secondhand wheels removed from service are to be remounted they shall be rebored in accordance with the requirements of this rule. Dismounted misfits having bores meeting the requirements of this rule in every respect may be remounted without reboring.*

2. Revise Rule 355 (n), as follows: *Proposed Form*—Wheel seats of secondhand axles must be re-turned prior to remounting. *Dismounted misfits having wheel seats meeting the requirements of this rule in every respect may be remounted without subsequent re-turning.*

3. Change Rule 356 (b), as follows: *Proposed Form*—Wheel mounting presses must be *equipped* with a dial pressure gage and a pressure recording gage. These gages must be in *reasonable agreement within the working range* and the dial gage must be checked at least *once* every six months *of service* by means of dead weight *testing for* accurate master gage *comparison. The test record shall be marked directly on the gage, showing date and where tested.*

4. Change Second Paragraph of Rule 355 (o) as follows: *Proposed Form*—The finished journal surfaces on all axles of plain bearing type in mounted wheels *being given any machining attention* must also be magnetic particle tested before being returned to service. (Also see Paragraph 221-A for axle defects, and Interchange Rules 84, 85 and 86.)

Wheel Balance—Passenger Cars

The summary of first progress report of effect of wheel unbalance, eccentricity, tread contour and track gage on riding quality of railroad passenger cars was studied with view of determining advisability of including in Standard Wheel Specification M-107 a clause requiring the manufacturers to limit dynamic unbalance to 2.0 lb. at face of tread for wheels used on high speed or streamliner service. The following are the conclusions:

1. It is not advisable to introduce any clause in the specification concerning limitations of unbalance. This requirement can be and has been currently fulfilled by semi-finish machining of wheels where it has been ordered. The semi-finish machining here covers the machining of rim and hub fillets in addition to other machining standard to the product. This machining operation virtually assures all wheels coming within this 2-lb. unbalance limit.

2. The report of the Central Research Laboratory is a com-

prehensive and thorough analysis of the subject, and warrants careful consideration by all railroads in evaluating the needs or benefits of balancing of wheels. To this end, it is suggested that the committee give consideration to recommending that the general summary of this report be covered in a circular letter to the railroads and included in the annual report.

3. It should be noted that at least a part of the cost of balancing wheels should be offset by the lower maintenance costs of truck equipment resulting from the reduction of wear in truck parts.

4. While the wheel tread eccentricity up to 0.035 in. produced no important effect on the riding of the test car, the existing tolerances on eccentricity should be observed since this contributes to lower cost in truck maintenance. In other words, the practice of providing concentric wheels is to be encouraged. It is particularly noted that 0.035 in. tread eccentricity was comparable in the effect on riding quality to one found total unbalance per wheel.

5. With reference to tread contour, there appears to be slight difference between the two standard patterns now employed as optional standards.

The members of the wheel committee are E. E. Chapman (chairman), mechanical assistant, Santa Fe; H. H. Haupt (vice-chairman), general superintendent motive power, Pennsylvania; I. N. Moseley, research and test engineer, Norfolk & Western; A. M. Johnsen, engineer of tests, Pullman Company; M. S. Riegel, assistant engineer of tests, New York Central; R. W. Seniff, engineer of tests, Baltimore & Ohio; P. V. Garin, engineer of tests, Southern Pacific; B. C. Gunnell, chief mechanical engineer, Southern; H. E. Wagner, superintendent car department, Alton & Southern; and A. M. Guschl, general foreman wheel shop, Milwaukee.

Discussion

Clifford Stoner, Association of Manufacturers of Chilled Car Wheels, referred to the proposed reduction of 15 lb. in weight of the single-plate bracketed cast-iron wheel and said that foundry experience shows the practicability of successfully manufacturing this type of wheel without change in dimensions and with a reduction of wheel weight from 850 to 835 lb. In connection with chilled-wheel failures, Mr. Stoner said that the indicated small increase in 1950 over 1949 was partly balanced by the increase in traffic and that the real safety record of this type of wheel continues to improve from year to year. He stated that wheel defects within present wear limits may be a contributing cause of hot boxes and that more facts rather than opinions are needed regarding wheel conditions. Mr. Stoner concluded his remarks with an appeal for railroads to return all scrap chilled wheels to the foundries where this material is urgently needed to keep up the output of new wheels.

P. V. Garin, (Southern Pacific) described progress in modernizing wheel shop on this road and outlined what can be accomplished with carbide-tip tools which increase production, cut through hard spots and may be designed to give smoother finish.

C. B. Bryant, Technical Board Wrought Steel Wheel Industry, emphasized the notable performance of one road mentioned in the committee report in reducing the number of Class A wheels removed for thermal cracking from 65 per cent to 2 per cent of the steel wheels in passenger-train service. To illustrate the increased severity of wheel service due to higher train speeds, Mr. Bryant said that a comparative study showed 48,000 passenger-train miles over 60 m.p.h. at the beginning of a 10-year period had jumped to 129,000 at the end of the period. Similarly, a study of time-table speeds showed that to maintain an average of 57 m.p.h., 22 per cent of the mileage is made between 80 and 90 m.p.h. and 15 per cent over 90 m.p.h. In other words, 37 per cent of the mileage is made at speeds over 57 m.p.h.

Mr. Bryant also commented on the increased loads on passenger-car and diesel-locomotive wheels and the variation in braking load which may be 250 per cent on one car and 150 per cent on an adjoining car on the same train. He said that manufacturers are doing everything they can to produce steel wheels which will meet increasingly severe service conditions due to higher speeds, heavier loads and greater braking effort, but they are approaching physical limits of the metal itself.

Mr. Bryant closed his remarks by citing the case of a steel wheel failure investigation which showed that a wheel hub, undercut by accident in machining, was built up by welding, remachined and failed in service. He urged a wider distribution and use of the Wheel and Axle Manual as a means of education to prevent such misguided zeal in saving company material.

A. G. Hoppe (Milwaukee) referred to the marking of diesel wheels and said this is essential so as not to lose the identity of wheels which must be investigated in cases of service failure. He said that ultrasonic inspection is intriguing, needs skillful interpretation and its use should be encouraged. Mr. Hoppe referred to the failure of roller-bearing axles and said these axles must be thoroughly inspected as well as plain-bearing axles. He said that some roads are nearly out of wheels for passenger service and cars will soon have to be set aside unless more steel is made available for multiple-wear wheels for passenger service as well as one-wear wheels for freight service.

(*The report was accepted and referred to letter ballot.*)

Tank Cars

During the past year, the Committee on Tank cars gave consideration to a total of 480 dockets and applications for approval of designs. Of these, 243 covered 6,941 new shipping containers for mounting on new cars or for replacement on existing cars.

Two applications covered the construction of 17 multiple unit cars to be used for the transportation of 15 Class ICC-106A500 or ICC-106A500-X type one-ton containers each. One application covered the construction of three new underframes for the application of existing trucks and the mounting of existing Class ARA-V tanks.

Applications covering alterations in, additions to, or conversions and reconditioning of 2,626 existing tank cars or shipping containers totaled 208. Eighteen applications requested approval of tank car appurtenance designs or materials without reference to specific cars.

Upon recommendation of the committee, concurred in by the I.C.C. Bureau of Explosives on September 12, 1949 Special Permit No. 504 was issued authorizing the equipping of two Class ICC 103-B tank cars tanks and their appurtenances with Q-187 Saran rubber lining for service trials in the transportation of hydrochloric acid. Upon further recommendation of the committee, concurred in by the Bureau of Explosives and following the satisfactory completion of 18 trips by the two tank cars so equipped, the commission, by issuance of revised special permit No. 504 dated June 27, 1950, extended the authorization to 25 additional Class ICC 103-B or 1CC-103B-W tank cars.

Upon recommendation of the committee, concurred in by the Bureau of Explosives, the Commission, by suitable orders dated August 29 and November 13, 1950, amended its tank car tank specifications, as follows:

Class 103-C, Par. 6(a)—For computing rivet areas the effective diameter of its reamed hole, which hole must in no case exceed nominal diameter of rivet by more than $\frac{1}{16}$ in. All rivets must be driven hot.

Class 106A800, Par. 14(b)—When longitudinal seam is water gas lap-welded, the mark must be ICC-106A800. When longitudinal seam is fusion-welded; the mark must be ICC-106A800X.

Class 103A-W, Par. 14(a)—Safety valves prohibited but a safety vent must be applied. Sulfuric acid, except oleum, mixed acid (nitric and sulfuric acid) (nitrating acid), and other fuming acids, may be transported in Spec. 103A-W tank cars having safety vents equipped with lead discs having $\frac{1}{8}$ in. breather holes in the center thereof.

Upon recommendation of the Committee on Tank Cars, the General Committee approved revision of the A.A.R. Specifications for Tank Cars, to read as follows: Spec. Class ICC-103-W, 103A-W, 103B-W, 104-W, 104A-W, 105A300-W, 105A400-W, 105A500-W and 105A600-W, Par. AAR-3(a):

AAR-3(a)—All plates used for tank and expansion dome, where expansion dome is required, must be of open hearth boiler plate steel of flange quality complying with requirements of current A.A.R. Spec. M-115, or A.S.T.M. Spec. A-201, A-212, A-285 with the carbon content of the plates used not to exceed 0.30 per cent. These plates may also be clad with other metals, such as nickel, etc.

AAR-13(c)—For outlet nozzles that project 6 in. or more from shell of tank a V-groove must be cut (not cast) in the upper part

of the outlet valve nozzle at a point immediately below the lowest part of the valve to a depth that will leave the thickness of the nozzle wall at the root of the vee not over ⅜ in. In the case of steam jacketed outlet nozzles this groove must be below the steam chamber but above the bottom of the center sill construction. Where the nozzle is not a single piece, arrangement must be made to provide the equivalent of the breakage groove.

AAR-9(b)—The manhole in the dome head must be of sufficient diameter to permit access to the interior of the tank. The opening in the tank shell must must be at least 29 in. in diameter and when the opening in the tank shell exceeds 30 in. in diameter the opening must be reinforced in an approved manner.

The report was signed by Chairman J. E. Keegan, chief car inspector, Pennsylvania; F. J. Harris, mechanical engineer (car) Canadian National; J. R. Hayden, superintendent car department, Missouri-Kansas-Texas; H. S. Marsh, superintendent car department, Missouri Pacific; N. A. Passur, engineer car construction, Southern Pacific; R. S. Venning, special engineer, Chesapeake & Ohio; R. M. Smith, vice-president, Union Tank Car Company; R. T. Baldwin, secretary, The Chlorine Institute, Inc.; J. M. Dahlem, master car builder, Mid-Continent Petroleum Corporation; R. W. Thomas, manager, research and development, Phillips Petroleum Company; T. H. Caldwell, maintenance superintendent, The Dow Chemical Company.

Discussion

R. H. Smith, vice-president, Union Tank Car Company, called attention to the fact that all but 38 of the 6,941 new shipping containers were of fusion-welded construction and complimented the committee on developing designs and specifications which assure the success of this radically new method of fabrication. He said that the first welded tank-car tank was built in 1932 and this type of construction was approved by the I.C.C. in 1941.

(*The report was accepted.*)

Axle and Crank Pin Research

This report is the first made by the committee since it was formed in 1949 by consolidation of the former Committee on Axle Research and the Committee on Crank Pin Research.

Passenger Car Axle Tests

The eighth progress report covering fatigue testing of quenched and tempered 5½-in. by 10-in. carbon steel axles at the Timken Roller Bearing Company's laboratory was approved by the committee and issued by the Mechanical Research office in February 1950.

Locomotive Crank Pin Tests

The 4th progress report covering tests of normalized and tempered and quenched and tempered crank pins at the Timken laboratory has been approved by the General Committee and distributed to the membership.

Current Committee Assignments

In addition to the following list of assignments the committee has reviewed drafts of the preliminary ninth progress report on passenger-car axle tests and a supplement to the fourth progress report on crank-pin fatigue tests. The status of the committee assignments is:

1. The development of a new design of freight-car axle, following the general dimensions of the raised-wheel-seat standard axle for passenger cars, with an "as forged" surface between the wheel seats instead of a machined surface. In collaboration with the American Iron & Steel Institute's Committee on Axles and Locomotive Forgings two lots of 5½-in. by 10-in. axle forgings have been produced. These experimental forgings are at the Timken laboratory for comparative tests with Design No. 1 (A.A.R. 1928 standard freight car axle) and Design No. 6 (A.A.R. standard passenger car axle.)

2. Laboratory investigations of overheated journals did not support the claim that axle failures classified as burned-off journals were due to the progression of cracks resulting from service stresses. Because of the importance of the subject the committee decided to initiate a test program to investigate service stresses in the journal area.

3. A table showing the capacity in pounds of axles under cars in BX (box express) service, based on a 72-in. center of gravity and 33-in. wheels, has been approved and submitted to the Committee on Car Construction. If concurred in, the table will be submitted as a letter ballot item for inclusion in the next Wheel and Axle Manual supplement.

4. Studies of "as forged" axles are being made in collaboration with the A.I.S.I. committee. It is proposed to use a dynamic balancing machine to measure the unbalance of axles having variations in "run out" at the center of the axles.

5. Tests are in process of M-101 axles as forged, and stress relieved.

6. On the basis of questionnaire returns the committee decided that additional tests of axles with generator pulleys are not desirable or necessary.

7. Tubular axle designs with increased wheel-seat diameter submitted by the manufacturer are being studied.

8. Committee recommendation on axle capacity ratings when used in tender service was concurred in by the Locomotive Construction Committee and approved by the General Committee for publication as recommended practice.

9. The committee recommendation on design, finishing instructions and application procedure for locomotive crank pins and wheel centers, with the report covering recommended practice to be followed in making fits with pre-stressed bores and rolled wheel fits, was concurred in by the Locomotive Construction Committee for adoption as recommended practice.

10. The axle journal (two-step diameter) for roller bearing application to freight car truck side frames of integral box type was approved by the committee for engineering design.

11. A program of laboratory tests on the development of fatigue cracks between wheel seats and covering a dynamic investigation of roller bearing passenger axles at high speeds is being studied.

12. Protective surface coating for the body portion of axles, proposed by a committee member, is being studied.

13. An investigation is being made of reports of tubular axle failures received from member roads.

The members of the committee are J. R. Jackson (chairman), mechanical engineer, Mechanical Division, A.A.R.; K. Cartwright, chief mechanical officer, New Haven; W. F. Collins, engineer of tests, New York Central; H. L. Decker, assistant mechanical engineer, Pennsylvania; H. H. Haupt, general superintendent motive power, Pennsylvania; F. J. Herter, engineer car construction, Chesapeake & Ohio; A. M. Johnson, assistant chief engineer equipment, New York Central system, and E. H. Weston, mechanical engineer, Chicago & North Western.

Discussion

The discussion centered chiefly on broken journals and the causes. The committee stated that their study concerned service stresses in the journal area, and they did not consider failures due to copper infiltration. It was hoped that the study can be continued with the hot-box alarm machine at Altoona as it can be used without modification. The committee hoped to test full, 1¼ and 1½ loads at 50, 75 and 100 m.p.h., using 5½-in. by 10-in. journals on 33-in. wheels. One 5-in. by 9-in. journal will also be tested, and the lubrication will be reduced at full load and 75 m.p.h. to investigate the heating and stresses.

Several roads reported experiences with journal failures. One found that about half showed no evidence of being caused by overheating. What heating was found was thought to have been caused by flexure after a fatigue crack had weakened the section. Another road found that 22 burned-off journals showed evidence of overheating in all cases, and there was copper penetration. A third road subscribed to the theory of copper penetration as being one of the main causes of burned-off journals; only one per cent breaking with no signs of heating.

The D. L. & W. ran a test on a loaded 70-ton hopper car to verify laboratory work on copper infiltration. A copper-free bearing ran red hot for 67 miles and was still intact. Lubrication was then removed from under a bronze bearing, and it burned off in 34 miles. The conclusion was that failure occurs two-thirds of the way from the axle collar where maximum heating occurs. There-

fore stresses are not considered. The journal breaks where it is in contact with copper.

(The report was accepted.)

Brakes and Brake Equipment

Charging Long Freight Trains

At the request of the committee the air-brake manufacturers have conducted extensive tests to determine how increasing the diameter of the opening through the hose coupling gasket would affect reducing freight-train charging time. These tests showed that a 1¼-in. opening would be the largest practicable opening in a gasket for fitting the recess of the standard hose coupling.

It was concluded from test results that little, if any, improvement in the charging time would be obtained by increasing the gasket opening from 1-3/16 in. to 1¼ in. Additional tests were then made to determine the maximum possible decrease in charging time resulting from the complete elimination of all coupling restrictions such as might be produced by a new coupling of a completely different size and a much larger gasket. Depending on the leakage and main reservoir pressure conditions, the deductions in charging time for train lengths of 50 to 150 cars varied from 5.5 to 17.7 per cent as compared with tests run with standard hoses and hose couplings. The air-brake manufacturers emphasized that to obtain even a part of this reduction in charging time would require an entirely new coupling and gasket with its attendant serious interchange problem. These tests also emphasized that the effect of opening the present hose-coupling gaskets to 1¼-in. diameter would be insignificant.

Tests run on a 150-car train equipped with hose-and-nipple combination (no coupling restriction) to determine the effect on service and emergency transmission showed that the performance of the AB brake would not be adversely affected.

AB Load Compensating Brake

The 25 Illinois Central 50-ton hopper cars equipped with the ABLC brake were inspected and given the single-car test after an average of 16 months of service. Following the test the operating portions were removed for rack test and examination with the following results:

Except for seven cases of inoperative slack adjusters due to burning of either the adjuster or the hose all brakes passed the single-car test. The railroad is planning to locate the adjuster at a less vulnerable point on 100 cars for trial.

Except for three cases where minors defects were found, all compensating valves passed all tests in the rack code for cleaned and repaired valves.

The brake cylinders were in good condition and well lubricated.

Two slack adjusters were replaced, one because of damaged teeth due to improper assembly and the second because of burning and rewelding of the body. Most slack adjuster hoses were replaced.

A complete report of the inspection and tests will be compiled as soon as possible.

Freight-Car Slack Adjusters

As of March 26, 1951, the following number of automatic freight-car slack adjusters were either in service or so contemplated by the end of next year on the railroads represented by members of the committee:

Mechanical adjusters: Universal, 135; King, 1,127; Ajax, 1,052; Gustin-Bacon, 102 and Locomotive Finishing Company, 50. Pneumatic adjusters: Westinghouse Air Brake Company, 565 (including 398 in service on the Illinois Central's ABLC equipment), and Ajax, 6.

The committee suggests that all roads make as many trial applications as possible so that service performance may be determined. The committee believes that the time is fast approaching when some form of slack adjuster should be recommended for application on all freight cars.

Revisions to Rules and Specifications

The committee has requested the Arbitration Committee to consider amplifying the stencil notes on the sketch, Page 135, Rule 60, in the Code of Rules from "Stencil here in location which presents clearest view from side of car" to read "Stencil on either side or either end of reservoir presenting clearest view from outside of car."

The revision of rules governing the maintenance of brake and train air signal equipment have been completed and forwarded by the General Committee to the I.C.C. Bureau of Safety for final approval.

The revision of A.A.R. Specifications No. 2518—Installation of AB Freight Brake Equipment has been completed and the air-brake manufacturers will be in a position to furnish them.

Charging Two Cars at One Time

To conserve time in charging air brakes prior to making single-car tests, two different devices have been designed for charging air brakes on two cars at the same time. A circular letter, dated

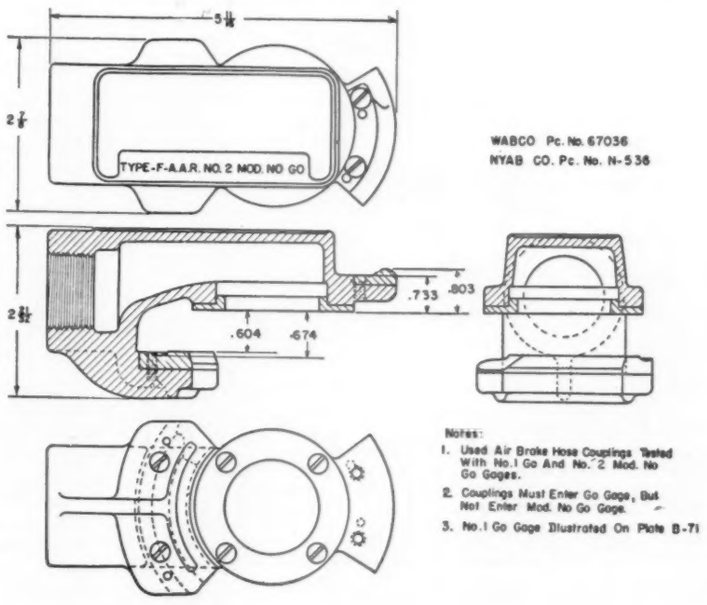


Fig. 1—Modified no-go hose coupling gage that condemns 15 to 25 per cent of worn couplings now passed by the present gage

February 5, 1951, explaining these devices was issued by the secretary. The use of these devices is permissible providing all details are strictly followed. Much time can be saved thereby. The intention is to incorporate these devices in the next revision of Air Brake Instruction Pamphlet No. 5039-4 Sup. 1.

Letter Ballot Items

The committee recommends the following as letter ballot items:

That Manual Page E-14 be revised by adding a new paragraph to provide instructions for applying the alternate standard type of hose nipple, and that Page E-17 be revised to coincide with the change in the instructions.

That a new Page E-78-A be added to include the 2½-in. steam-heat coupler head. Also, that Page E-78-1947 be revised to change the incorrect 1-7/16-in. radius at the latch portion to the correct dimension of 2-7/16-in.

The Manual Page B-72 be revised to include a gage, modified by the manufacturers by request, that will condemn 15 to 25 per cent of the badly worn brake lips and grooves of the brake-pipe hose coupling that are passed by the present gage. Its adoption will reduce the number of worn couplings now being reused which may be responsible for excessive brake-pipe leakage in freight trains.

That Manual Page E-14 be modified so that water may be used as a bonding agent when mounting rubber air-brake hose. Tests conducted by several members of the committee indicated that water is satisfactory for this purpose.

That the double-lip "Canadian" type of air-hose gasket be adopted as an A.A.R. alternate standard gasket and included in Specification M-602, Section A of the Manual. This gasket has been in service on some of the roads represented by the committee members and a marked improvement was made in reducing brake-pipe leakage, especially when used in worn hose couplings.

Subjects Under Consideration

The committee is considering or investigating the following items:

Brake system leakage on freight-train cars is being actively investigated to determine what further action could be taken to reduce leakage.

Standardization of air brake equipment on diesel locomotives.

Elimination of oil and moisture from air lines, particularly on diesel locomotives.

Location of AB valves on standard hopper cars.

Investigation of electro-pneumatic brake-circuit checking devices for diesel locomotives.

Investigation of terminal charging facilities for freight trains to reduce the moisture in yard air lines.

Condemning gage for use on AB valve gaskets.

The members of the committee ar J. P. Lantelme (chairman), assistant engineer, Pennsylvania; H. I. Tramblie, (vice-chairman), air brake engineer, Burlington; R. J. Dewsbury, general air brake inspector, Chesapeake & Ohio; R. N. Booker, general air-brake inspector, Southern Pacific; W. D. Bowser, engineer air brakes and train-control design, Union Pacific; D. R. Collins, superintendent air brakes, Denver & Rio Grande Western; F. T. McClure, supervisor air brakes, Santa Fe; A. J. Pichetto, general air brake engineer, Illinois Central; L. D. Hays, engineer brake equipment, New York Central; L. A. Stanton, general air brake instructor, Great Northern; and C. C. Maynard, chief inspector air brakes, Canadian National.

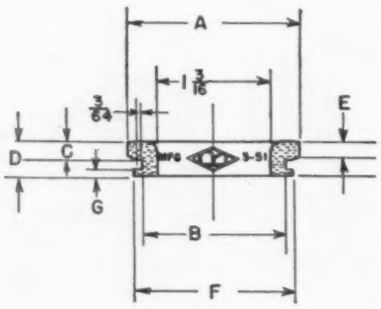
Discussion

R. E. Baker (Boston & Maine) said that excessive brake-pipe leakage still causes trouble in train operation, particularly in sub-zero temperatures, and this leakage occurs not only at AB valve back covers, but on angle cocks, old hose couplers and in the brake-piping system. He questioned the desirability of reducing tolerances in the no-go hose coupling gauge, as suggested in the report, and also the economics of requiring the application of slack adjusters to all freight cars which are on repair track periodically for other work.

F. G. Moody, (Northern Pacific), also advised going slowly before making slack adjusters mandatory on all freight cars owing to maintenance difficulties. He said that railroads in the Northwest had hoped for more definite recommendations for reducing brake-pipe leakage in the committee report, the magnitude of this difficulty being indicated by the fact that last winter the Northern Pacific had to reduce the length of 105 trains an average of 11.7 cars per train to keep rear-end brake-pipe pressures within desired limits. Mr. Moody indicated that little real progress has been made in reducing leaks at AB valve back covers, ball-check covers and gaskets.

At the request of Chairman Lantelme, H. I. Tramblie, (C. B. & Q.), explained that the committee did not enlarge on the subject of brake-pipe leakage which was thoroughly covered in previous reports. He said that leaks other than those at AB valves need more attention and that freight cars are not now getting in-date air-brake tests while on repair tracks as generally as desirable. He urged chief mechanical officers to explain what steps are being taken to get this important work done.

(The report was accepted and referred to letter ballot.)



	A	B	C	D	E	F	G
Min.	1.796	1.484	.166	.341	.135	1.6719	.074
Nom.	1.812	1.500	.171	.343	.140	1.687	.078
Max.	1.828	1.515	.176	.354	.145	1.7031	.0831

Fig. 2—Double-lip "Canadian" type air hose coupling gasket

Safety Appliances

During the preceding year the committee considered a total of 101 applications for approval of designs of safety appliance details for use in construction, alterations or conversions of tank cars, as follows:

Item	No. of Designs
Dome platform arrangements	53
Dome step arrangements	19
Dome step and platform grating arrangements	24
General arrangements	3
Runway arrangements	1
Safety railing arrangements	2
Side ladder arrangements	43
Total	145

Since the last report, one new design of metal running board has been investigated, tested and approved. This design has been listed in the Interchange Rules under "Steel Running Boards" in Groups 1, 2 and 3 as "William F. Klemp Company's Welded Grating."

Application for approval of another new design of metal running board from another company is now under consideration. Application for change in securement details of another metal running board already included in the approved list is also being considered.

Progress was reported on revising the publication entitled "Maintenance of Air Brake and Air Signal Equipment on Locomotives and Cars."

The interested committees are following the service performance of the Illinois Central's 398 lightweight hopper cars equipped with "ABLC" brake equipment. The brake equipment on 25 of these cars, which have been in service an average of 16 months was inspected by the Committee on Brakes and Brake Equipment, and a summary included in that committee's report.

Members of the committee are R. G. Henley (chairman), general superintendent motive power, Norfolk & Western; H. T. Cover, assistant vice president and chief of motive power, Pennsylvania; G. W. Bohannon, chief mechanical officer, Chicago & North Western; F. K. Mitchell, manager of equipment, New York Central; J. M. Nicholson, mechanical and research engineer, Santa Fe; A. K. Galloway, general superintendent motive power and equipment, Baltimore & Ohio.

(*The report was accepted.*)

Labor and Material Prices

Labor rates

Immediately upon receipt of announcement of the 12½ cents increase in hourly wage rates paid to employees engaged in car repairs, all combination labor and material allowances in Rules 101, 107, 111 and Passenger Car Rules 21 and 22 were reviewed and the labor portion modified in Supplement No. 1 to the 1951 Code, effective April 1, 1951.

Item 92 in Rule 107, and items 19, 19-A and 20 in Passenger-Car Rule 21 covering labor rates were increased and these changes were announced in circular letter issued by the secretary on March 3, 1951, effective as of March 1.

Upon receipt of announcement of a further increase of six cents in hourly wages paid to employees engaged in car repairs, all combination labor and material allowances in Rule 101 were reviewed. However, it was found that applying the six-cent increase resulted in only a small increase in the large majority of the items. No further modifications in this rule were recommended prior to the usual August 1 Supplement.

Following the wage increase, Item 92, Rule 107, covering freight-car labor, was increased to $3.10 per hour and key items in this rule modified accordingly. Items 19, 19A and 20 of Passenger Car Rule 21 were similarly modified. These changes were announced in a circular letter issued by the Secretary on April 27, 1951, effective as of May 1, 1951.

Rule 101—All miscellaneous material prices in Rule 101 were rechecked as of March 1, 1951, quotations submitted by the purchasing agents of the ten selected railroads, representing 39 per cent of total freight-car ownership in the United States and Canada, showing an upward trend in material markets as indicated by detail recommendations for revisions shown under this rule.

A new note is added following Item 1 to provide the basis for charges and credits for all sizes and designs of armored-type air hose. Item 115-A covering brake-beam safety chain is obsolete and is eliminated. A new note is added following Item 169-I to provide charge for R. & R. of packing retainer devices on cars so stenciled, when in connection with periodic repacking of journal boxes.

Rule 107—A new Item 100-A is added to provide labor charge for packing retainer devices applied separately.

Rule 111—Paragraph 1 is modified to indicate that release valves mentioned therein do not include AB Duplex reservoir release valve.

Rule 112—Recommendations are made in this rule respecting reproduction pound prices of new freight cars of all classes, in order that Supplement of August 1, 1951, may reflect 1950 costs in lieu of figures shown in the present Code. New prices recommended are based on the cost of 23,500 freight cars constructed during the year 1950. The last sentence of Par. 4 Sec. B is modified to indicate that Class XIH cars shall be settled for on reproduction cost basis.

Passenger Car Rule 22—Item 14-A is modified to clarify the intent that same applies to current from a d.c. line. New Item 14-B and new note following are added to provide a charge for electric current on cars equipped with a.c. conversion apparatus.

Time studies are to be made by a special subcommittee covering periodic attention to AB and AB-1-B type and D-22 type air brake equipment. When these studies are completed, and if results justify modification of existing allowances or the addition of new items, such changes or additions will be made.

Further studies are to be made covering periodic repacking of journal boxes, on passenger as well as freight equipment. If the results of this study justify modification of existing allowances, such changes as are necessary will be made.

A joint study is being made by a special subcommittee composed of members of the Committee on Prices for Labor and Materials and the Committee on Couplers and Draft Gears, to determine whether or not the present secondhand allowances and average credits for approved and nonapproved types of friction draft gears, as specified in interchange Rule 101, are equitable. If the result of this study indicates modifications are necessary, such changes will be made.

In view of the possibility under present labor contract arrangements of there being four changes each year on account of fluctuation in cost of living allowances, plus the regular scheduled issuance of supplements, it is felt that the Arbitration Committee should review this situation from a policy viewpoint and determine what should be done to cope with it with the least confusion.

It is the intent of the committee to investigate labor and material costs again in October; if sufficient change develops, necessary revision will be made and inserted in the rules effective January 1, 1952.

Where price change only is involved, the wording of many of the price items contained in this report has been abbreviated, in the interest of brevity and the reduction of unnecessary material.

The report was signed by Chairman T. J. Boring, general foreman, M. C. B., Clearing House, Pennsylvania; Vice-Chairman P. F. Spangler, superintendent car department, St. Louis-San Francisco; J. D. Rezner, superintendent car department, Burlington; L. B. George, assistant chief motive power and rolling stock, Canadian Pacific; G. J. Flanagan, general car inspector, New York Central; R. M. Smith, vice-president, Union Tank Car Company; A. H. Gaebler, superintendent car department, General American Transportation Corporation; L. R. Schierbecker, assistant superintendent car department, Illinois Central.

(*The report was accepted.*)

Geared Hand Brakes

A. A. R. certificates of approval have been issued for 31 types of geared hand brakes—19 vertical-wheel, 9 horizontal-wheel and 3 lever types. The changes to be made in the listings of A. A. R. approved hand brakes as shown in Interchange Rule 101 (Code of Rules dated January 1, 1951) are:

Manufacture of The Orme Company's Champion vertical-wheel hand brake, Drawing 1124, has been discontinued.

Manufacture of Klasing vertical-wheel hand brake, Drawing D-959, has been discontinued, except for repair parts.

Klasing vertical-wheel hand brake, Drawing D-1051, is added to the list.

Superior vertical-wheel hand brake, Drawing 726, is added to the list.

Union Asbestos & Rubber Company's (Equipment Specialties Div.) vertical-wheel hand brake, Drawing 3750, is changed to Drawing 3750-A.

Superior horizontal-wheel hand brake, Drawing 565-E, is added to the list.

Superior horizontal-wheel hand brake, Drawing 603-D and 668-B, is changed to Drawing 603-E and 668-A.

Standard Bell Crank—Tests of the A.A.R. 50 bell crank (shown in Fig. 1, 1950 report) show that the variations in power, when substituted for the manufacturers' designs, are relatively slight. Therefore, retests of certified hand brakes because of this substitution are not considered necessary. The committee recommended, as a letter ballot item, that A.A.R. specifications be revised to include the requirement that the A.A.R. 50 bell crank be furnished

with all vertical-wheel and lever-type hand brakes, and that the drawing be incorporated in the manual.

Sheave Wheel—Certificates of approval for lever-type hand brakes are based on tests of these brakes in combination with bell cranks. To protect situations where it is necessary to substitute a sheave wheel for the bell crank the committee recommended, as a letter ballot item, that a paragraph be included in the A.A.R. specifications for geared hand brakes to make sheave wheels permissible providing multiple levers are used to bring the power of the piston up to the required force.

Uniform Brake Chain Length—Tentative agreement has been made of a standard length of 21-9/16-in. from the center line of the lower attachment rivet hole in the housing to center line of clevis rivet or bolt (connection to vertical pull rod). In the interests of interchangeability the brake chain (upper unit) for geared hand brakes of the vertical-wheel type should be furnished accordingly.

Non-Standard Hand Wheels—The committee is investigating the interchangeability of hand wheels desirable from a maintenance and repair point of view. Exceptions have been taken to this procedure because it makes correct identification of the various makes confusing and difficult.

Location of Brake Step—The drawings in the Supplement to the Manual have been changed to show the brake step level with the adjacent end ladder tread as recommended in the 1950 Report.

Foot-Operated Geared Brake—Tests of a full-size metal model of a foot-operated brake developed by a railroad employee showed it to be materially deficient in power, indicating the need for radical design changes. The matter is being continued for further consideration and consultation with the inventor.

The members of the committee are E. P. Moses (chairman), engineer car equipment, New York Central System; J. P. Lantelme, assistant engineer, Pennsylvania; H. L. Holland, assistant mechanical engineer, Baltimore & Ohio; W. A. Pownall, assistant to general superintendent motive power, Wabash, and J. R. Jackson, mechanical engineer, Mechanical Division, A.A.R.

(*The report was accepted and referred to letter ballot.*)

Sanitation Progress

On completion of the sanitary research project, under the supervision of the Joint Committee on Railway Sanitation and under the direction of Dr. Abel Wolman, the positions of sanitary engineer, mechanical engineer and secretary were transferred to the central research laboratory at Chicago, the group being identified as the Office of Sanitary Research.

The "Final Report of the Railroad Members of the Joint Committee on Railway Sanitation," accompanied by a summary report of the development work carried on by the research project since January 1946, was submitted to Vice-President Aydelott on February 28, 1951. Copies are being referred to the General Committees of the Operating-Transportation, Mechanical, and Engineering Divisions for comment and recommendations as to further handling.

The committee lists four additional technical reports which have been distributed to the railroads. These are: No. 5, A Study of Passenger Traffic and Its Relation to Quantities of Toilet Wastes; No. 6, Bacteriological Studies of the Effects of Human Waste from Passenger-Carrying Cars on Railroad Right-of-Way; No. 7, Retention of Sewage Wastes from Railroad Passenger Cars, and No. 8, Disposal and Treatment Processes for Sewage Wastes from Railroad Passenger Cars.

The committee has reviewed with the U. S. Public Health Service a number of proposed changes in the Interstate Quarantine Regulations, a revised edition of which will soon be available. It has also cooperated with that service in the preparation of three new handbooks on Sanitation of Railroad Servicing Areas, Sanitation of Railway Passenger Car Construction, and Sanitation of Dining Cars in Operation. These will in due course supersede the Sanitation Manual for Land and Air Conveyances Operating in Interstate Traffic and A. A. R. Circulars M&S 133 and M&S 194.

Service test of the Sphincter Retention Valve applied to some of the toilet hopper chutes of a New York Central sleeping car continues, with no difficulties of consequence reported to date.

The members of the joint committee are as follows: Mechanical Division: E. P. Moses (chairman), engineer, car equipment, New York Central system; E. E. Chapman, mechanical assistant, Santa Fe; H. M. Wood, assistant chief of motive power car, Pennsylvania. Engineering Division: R. C. Bardwell, superintendent water supply, Chesapeake & Ohio; H. W. Van Hovenberg, engineer of tests and sanitation, St. Louis Southwestern; A. B. Pierce, engineer of water supply, Southern system. Medical & Surgical Section: Dr. R. M. Graham, director, department of sanitation and surgery, Pullman Company; Dr. A. M. W. Hursh, chief medical examiner, Pennsylvania. U. S. Public Health Service: Mark D. Hollis, assistant surgeon-general, chief sanitary engineering division; E. C. Garthe, sanitary engineering division, in charge land and air carrier division; C. H. Atkins, sanitary engineer, land and air carrier section. Department of National Health and Welfare, Canada: J. R. Menzies, chief, public health engineering division D. Secretary, H. S. Dewhurst.

(*The report was accepted.*)

Car Construction

[The committee included in the report tables showing that of 93,677 new house and hopper cars ordered from May 1, 1950, to April 30, 1951, inclusive, all conformed to A.A.R. standards of design, throughout or conformed thereto essentially, except for variations in inside dimensions to meet specific conditions, including lightweight low-alloy steel cars, and cars with floating center sills (1,300 box cars). Of the 143,588 cars of the flat, gondola, hopper, refrigerator, stock and special types ordered during the same period, 136,172, or 94.8 per cent, have the standard 25¾-in. center-plate height.—EDITOR.]

News Freight-Car Designs

In accordance with Interchange Rule 3 three new freight-car designs were reviewed and approved for interchange service during the year, as follows: Car structure for mounting two-unit glasslined tanks of 7,800 gal. total capacity to be used in the transportation of chlorosulphonic acid, General American Transportation Corporation; a structure, including anchorage, to be used for transportation of 15 one-ton containers and contents, American Car & Foundry Co.; flat car, 50 tons capacity, Virginian.

Alternate Hopper-Car Bolster

An improved bolster brace at the center sill, has overcome failures of the I-beam body bolster included in the "Victory" designs of 50- and 70-ton self-clearing hopper cars. It is recommended for adoption as an alternate standard. It saves approximately 300 lb. per car and is cheaper to fabricate and apply than the built-up construction.

Refrigeration Research

Reports have been made on the work accomplished on standing and laboratory tests as well as on road tests of various aspects of refrigeration. A large part of the standing and laboratory tests have been directed to the use of salt and ice mixtures. These include tests of various percentages of salt and bunker ice, including the use of various types of mined and sea salt, some with inhibitors in the ice and salt mixtures, analysis of salt samples in use by car lines and carriers and a study of commodity temperatures using salts other than NaCl on bunker ice in shipments of frozen foods.

A report to the United Fresh Fruit & Vegetable Association Committee on Refrigerator Cars, looking toward the standardization of loading and unloading platform construction, was also mentioned. Road tests reported include a comparison of overhead bulkhead fans with floor fans in transcontinental tests, a comparison of standard refrigeration against a limited number of reicings, transcontinental tests on frozen food using various percentages and sizes of salt on bunker ice, and a test by the U. S. Department of Agriculture of the use of alcohol heaters in the transportation of bananas between New Orleans and Winnipeg, Man.

Work recommended for 1951 by the committees supervising these studies includes a series of individual car tests between

Chicago and New York to develop new rules reducing ice issues; frozen-food tests, using new equipment, for the use of legal departments before the Interstate Commerce Commission on truck hearings; ventilation tests on tomatoes in cars moving through changeable and cool weather, and on potatoes. Studies are now taking place looking toward frozen-foods tests with mechanical refrigeration and other new types of refrigerator cars.

The question of insulation studies was deferred to the next general meeting. The refrigerator car research division has been instructed to study the absorption of water vapor by insulation.

Fire-Resistant Insulation

Where heat is used in repair operations on refrigerator cars fires break out in certain insulating materials after the work has been done. The committee proposes for letter ballot determination that supplement to Manual Plate C-2, Specifications for Standard Freight Refrigerator Cars, be modified by the addition of the following to Item 9—Insulation: "Insulation used must be such that it will not support combustion, which will include enveloping materials used in connection with blanket form insulation."

Pressed Steel Plywood Box Car

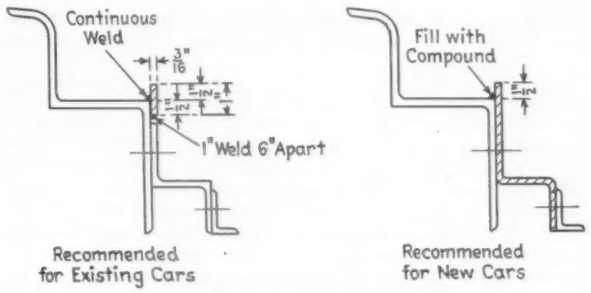
Up to the present the pressed steel box car has satisfactorily passed the compression test. It is now being tested in freight service directly behind the locomotive on the Milwaukee in freight runs between Chicago and the Pacific Northwest.

Freight Car Details

Nailable Steel channel-type flooring is strong enough to be used with one 3-in. 6.7-lb. longitudinal floor stringer on each side of the center sill, with conventional crossties and crossbearings, if the steel floor sections are welded to the stringer. This is proposed for letter ballot action.

Damage caused by water dripping from car roofs at doorways, of which shippers of flour-mill and similar products complain, can be prevented at small cost in the construction of new cars or on rebuilt cars. Drawings covering the design of a water deflector for existing cars and for new cars have been prepared for inclusion in a revision of the Supplement to the Manual.

Changes in and additions to the drawings of standard steel-



Water Deflector to extend 12 In. each Side of Door Post

Water trough over doorway for A.A.R. standard box car

PRELIMINARY SUMMARY OF 1950 COOPERATIVE FREIGHT-TRUCK AND SNUBBER RESEARCH PROGRAM

Manufacturer and design designation	Truck spring arrangement		Rail load 169,000 lb.—Speed up to 65 m.p.h.					Rail load 145,000 lb.—Speed up to 90 m.p.h.					Rail load 60,000 lb.—Speed up to 90 m.p.h.				
			Lading damage index					Lading damage index					Lading damage index				
				Vertical		Lateral			Vertical		Lateral			Vertical		Lateral	
	No. double coils per Car Set	Travel in	Avg. speed	Yardstick Car ASFX–1940	Companion Car ASFX–1941	Yardstick Car ASFX–1940	Companion Car ASFX–1941	Avg. speed	Yardstick Car ASFX–1940	Companion Car ASFX–1941	Yardstick Car ASFX–1940	Companion Car ASFX–1941	Avg. speed	Yardstick Car ASFX–1940	Companion Car ASFX–1941	Yardstick Car ASFX–1940	Companion Car ASFX–1941
ROAD TESTS OF CONVENTIONAL SPRING-PLANKLESS DOUBLE-TRUSS TRUCKS WITH A.A.R. 1948 COIL-SPRING UNIT SNUBBER COMBINATION PER MANUFACTURERS RECOMMENDATION																	
Miner C-5-L snubber[3]	16[1]	2½	44.4	9427	30375	2594	2735	....	....	....	....	....	44.8	11355	24141	3019	5446
ROAD TESTS OF CONVENTIONAL SPRING-PLANKLESS DOUBLE-TRUSS TRUCK PACKAGE GROUP SNUBBERS																	
Barber SP-21-A package	16	2½	45.6	10828	12965	3124	2151	62.0	32331	26505	5794	11220	56.9	24828	74969	5358	10315
Cardwell P-50 package[3,4]	16	3 1/16	44.8	10264	7764	2129	1428	59.4	33732	25969	5734	4200	65.4	51536	50251	13484	8064
Frost package snubber[5]	16	3 1/16	44.7	10217	5276	2091	2069	58.4	27265	17781	7000	3421	62.3	36628	64968	8236	5832
Miner P-1 package	16	2½	42.1	9544	7993	2381	3282	62.3	30000	22844	6126	10188	59.8	41021	38933	8429	7002
ROAD TESTS OF SPECIAL DESIGNS OF HIGH SPEED TRUCKS WITH LONG TRAVEL SPRINGS AND BUILT-IN SNUBBING DEVICE																	
Barber S-2-A truck	20[6]	2½	45.4	11320	7716	2461	2940	66.0	33006	26601	4922	6145	65.3	55595	57955	11879	4741
Monroe shock absorbers[8]	20[7]	2½	37.7	824	13378	401	1685	....	....	....	....	....	....	....	....	....	....
Barber S-2-B truck[13]	20[9]	3 1/16	43.6	9202	6276	2193	2267	62.8	33348	22127	6875	3411	64.3	49377	43323	9045	6292
Scullin LV-50 truck	20	3 1/16	44.9	9519	1806	2472	685	60.0	32043	7604	6375	3223	66.9	52383	42192	9771	5093
SKF roller bearings— Y 7571 Arrg. ASF A-3 truck[10]	20	3 1/16	42.9	9257	2056	2106	177	61.9	29573	12188	9637	899	61.1	47887	30360	9559	1345
SKF roller bearings— Y 7566 Arrg. ASF A-3 truck[10]	20	3 1/16	43.5	8325	1783	1938	161	56.7	29232	8384	7841	469	59.9	39735	26080	8640	314
Holland R-S-8 truck	20[11]	2½	42.8	7571	5571	1575	2879	62.7	29773	27100	6525	6496	59.6	39096	31552	8610	8390
Holland R-S-8 trucks C.E.S.D. springs	20[12]	3 1/16	42.7	8555	7357	2001	2030	60.6	25024	26308	5144	6593	61.9	40629	28452	8623	6633
Endsley tapered column truck	20	3 1/16	44.0	8862	3187	2106	955	58.0	27300	13426	6573	2687	62.6	46097	54155	10066	4901
Scullin CC truck	20	3 1/16	44.1	9242	1497	1923	841	62.9	29542	7709	7356	2131	63.4	47195	42082	8544	4780
National C-1 (lateral motion) truck	20	3 1/16	44.1	10846	3045	2162	1257	63.9	31630	19874	7694	4011	62.1	48383	37673	11602	5876

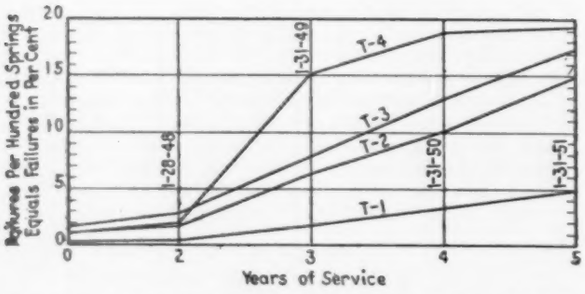
[1] 16 outer coils, 12 inner coils and 4 snubbers.
[2] Speed up to 65 m.p.h. in the 60,000-lb. run.
[3] Total trip mileage reduced from 124 to 123 miles on the 145,000-lb. run.
[4] Maximum speed limited to 79 m.p.h. by Illinois Central Operating Department on the 145,000-lb. and 60,000-lb. runs.
[5] Total trip mileage reduced from 124 to 121.7 miles account of hot journal on the 145,000-lb. run.
[6] Barber "S-2-A" Trucks equipped with 20 outer coils and 4 inner coils per car set.
[7] Monroe Trucks equipped with 20 outer coils and 8 inner coils per car set.
[8] Speed restricted to 40 m.p.h. after 26 miles of N. B. Run. Monroe Trucks withdrawn after N. B. Run at the request of the manufacturer.
[9] Barber "S-2-B" Trucks equipped with 20 outer coils and 16 inner coils per car set.
[10] American Steel Foundries "A-3" truck—Pedestal type with SKF Roller Bearings.
[11] Holland "R-S-8" Trucks equipped with 20 outer and 8 inner coils per set.
[12] Holland "R-S-8" (C.E.S.D.) Trucks equipped with Holland Constant Effective Static Deflection Springs, 20 outer coils and 16 inner coils per car set.
[13] Maximum speed limited to 79 m.p.h. by Illinois Central Operating Department on the 145,000-lb. run.

NOTES:

American Steel Foundries 5-car service laboratory operated as special train over Illinois Central Rails—Clinton to Gilman, Ill. Road tests as run between April 19 to July 18, 1950.

All devices were tested in new or broken-in condition.

The trucks under the "Yardstick Car" (ASFX—1940) were equipped with ASF "A-3" Ride-Control Trucks with 2½-in. travel spirngs. These trucks remained under the "Yardstick Car" during the entire 1948, 1949 and 1950 road test programs.



A.A.R. service-life test of helical springs in fright cars. Outer-coil failures as reported for 2, 3, 4 and 5 years of service

sheathed box cars in the Supplement to the Manual recommended by the committee last year because of changes in methods of loading and improvements in shop practices have been made. The major changes thus effected are: strengthened body bolsters (1/16 in. thicker webs and 3 in. wider top cover plate); floor stringers continuous in one piece between bolsters; crosstie added at the center of the car on both 40- and 50-ton steel-sheathed box and auto-box cars; an alternate of six floor stringers desirable for cars subjected to heavy loads handled on lift trucks with an increase in the weight of a 40-ft. 6 in. car of about 440 lb.; alternate side-sill arrangements one of which permits the removal and replacement of floor boards without disturbing the inside lining at a weight increase of about 150 lb.; and floor boards of thickness increased as desired.

The committee recommends for letter-ballot action that Manual page C-28D show four intermittent 1-in. welds on the draft-key retainer lock instead of 4½ in. continuous welds on each side.

The committee also recommends for letter-ballot action that Manual sheets C-10 and C-10B and the figures pertaining to the splicing of steel center sills referred to therein be revised to clarify the intent and to provide for the repair reinforcing of channel type steel center sills by welding.

High-Speed Freight-Truck Study

The committee includes a tabulation of the results of the 1950 road-test program in the cooperative freight car truck and snubber research project conducted on the Illinois Central with the American Steel Foundries five-car service laboratory. Report No. f3800 summarizing the results of all road tests conducted during 1948, 1949 and 1950 is in preparation by the Mechanical Division Research office. It will also include investigations of solid-type journal-bearing performance, a roller-bearing research program, lateral action of freight-car trucks, accelerometer calibration and side-frame stresses, and studies of vibration in freight cars.

Laboratory studies of life expectancy of the snubbing devices and constructions showing satisfactory performance during the three-year road-test program will be carried out at the A.A.R. draft-gear laboratory at Purdue University.

Side Frames and Bolsters

During the past year 45 additional designs of truck side frames and 59 additional designs of truck bolsters have been approved and identification numbers assigned. Three additional side-frame patterns were approved under identification numbers previously assigned because the new patterns differ in no essential respect from those to which the numbers were originally assigned.

Changes have been made in the regulations governing applications for approval of side frames and bolsters. Two changes have been added to those which can be made in journal boxes under the approval of the base pattern design: (1) modifications in journal boxes to permit the use of cartridge-type roller-bearing units; and (2) change in the design of the journal box to provide a removable lower portion to facilitate wheel changing. The addition or removal of brackets for Creco double economy or Creco double equalized brake-beam safety guards and addition or removal of holes for brake-beam safety guard brackets for Buffalo, Grip Nut, Drexel, Creco double economy, or Creco double equalizer brackets, are included under the same provision with respect to bolsters. A change in side-bearing spacing within certain limits is also included. The revised regulations are recommended for inclusion, respectively, in truck bolster and truck side-frame specifications. This is proposed for letter-ballot action.

Helical Spring Tests

Service life tests of helical springs instigated in 1945-46 by a sub-committee of the Car Construction Committee had run five years at the January 31, 1951, report. The test consisted of 100 car sets of A.A.R. 1936 1⅝-in.-travel springs (T-1); 100 car sets of proposed 1944 1⅝-in.-travel springs (T-2); 100 car sets, 2-in.-travel springs (T-3); 10 car sets, 2½-in.-travel springs (T-4). The essential results of these tests are shown in the table.

SPRING FAILURES DURING THE FIVE-YEAR TEST OF RAILWAY SPRINGS FOR FREIGHT CARS

	T-1	T-2	T-3	T-4
Total failures:				
Outer coil	73	238	348	31
Inner coil	12	4	15	5
Cars still in service	93	83	82	10
Outer coil failures per 100 coils initially installed	4.87	14.87	17.40	19.37
Failure index with T-1 failures as unity	1	3.05	3.57	3.97

Service Test of Brake Beams

The 1949 and 1950 reports of the Car Construction Committee refer to a number of brake beams which have been applied on various cars for road service tests. These beams were designs by the brake-beam manufacturers' mechanical committee and represented both the Unit type and brake-hanger type.* Periodical inspection of these beams will be continued. The progress of the tests after approximately three years of service is as follows:

Brake-beam designation A.A.R. No. 3	101	102	103	104	105	501	502	503
No. of beams applied 4	48	48	48	48	48	24	46	22
No. of beams removed since beginning of test due to failure of beam 1	4	2	3	12	2	0	1	0

Certified Brake-Beam Repair Specification

The committee has prepared a set of specifications proposed for the repairs to certified brake beams for freight cars which it recommends for submission to letter ballot. The specification covers dismantling, inspection and reconditioning of parts, assembly, testing, and marking.

Brake Beams for Special Freight Cars

All applications from manufacturers for approval of brake beams for application to cars of special construction on which standard beams cannot be used are to be submitted to the secretary's office to be passed on by the subcommittee on brake beams for approval. If approved, a certificate number will be assigned and all tests waived where the design is similar to designs already approved. Provisions for making the beams are also specified.

Stenciling for Special Equipment on Refrigerator Cars

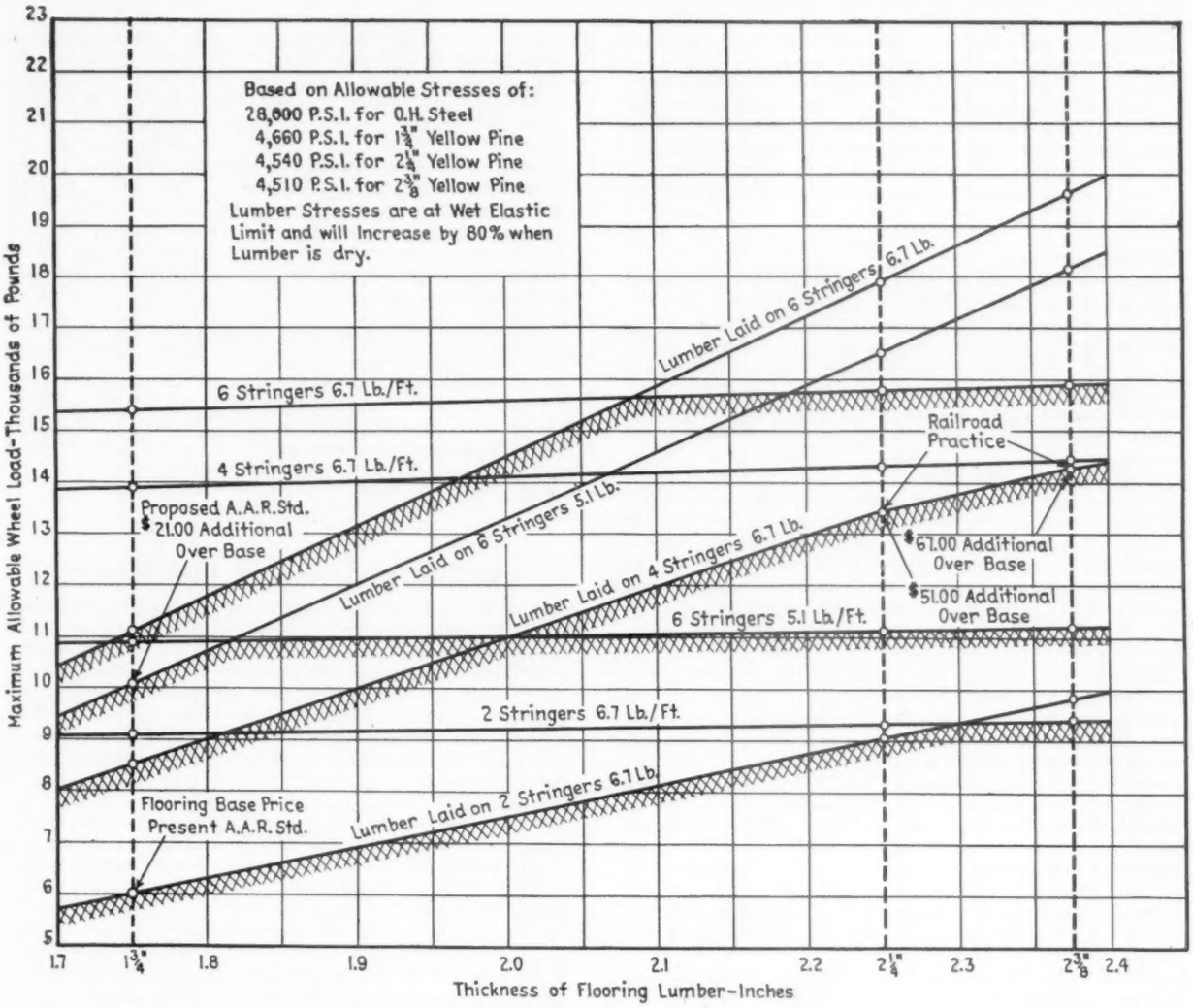
Operating men find it difficult to read stenciling on refrigerator cars for special equipment such as fans, stage icing, convertible bunkers, etc., in the upper left-hand corner of the car. The committee proposes for letter-ballot action that Manual page L-39-B be revised to show special stenciling to the left of the car number.

Strength of Car Floors

There is still a large railroad ownership of box cars having 1¾-in. wood flooring with only one longitudinal floor support between the side sill and center sill; numerous other cars with one floor stringer and 2¼-in. or 2⅜-in. wood flooring; and many cars have the present standard A.A.R. floor consisting of 1¾-in. flooring with two longitudinal floor stringers on each side of the center sill. All these combinations have been found lacking in sufficient strength for present-day heavy loading practices.

Various expedients have been advanced temporarily to correct these deficiencies. Some car owners have laid an auxiliary ¾-in. floor diagonally over the top of the present 1¾-in. floor. An addi-

* These beams are described in the 1949 committee report.



The shaded curves are the strengths of the combination of floor thickness and stringers under a 50-ton box car 40 ft. 6 in long inside, with a crosstie at the center of the door opening, continuous stringers and yellow pine lumber. Stringer spans are 44⅛ in., determined by crosstie spacing. At door opening the stringer span is 33 in., increasing board strength about 10 per cent and stringer strength about 30 per cent. No allowances for wear or dynamic load is included.

Diagram showing the effect on strength of freight-car floors of changing the lumber thickness on various stringer combinations

tional floor stringer has been added, making two on each side of the center sill. In the case of the car with the 2¼-in. or 2⅜-in. floor, this has merit, but with the 1¾-in. floor it still does not create a trouble-free floor. The addition of a perforated steel plate, extending from door to door, has materially improved the condition at the doorways where most of the damage occurs, but it is not the final answer.

Special steel channel floors, although affording relief from ordinary floor weakness, are quite expensive. A wood floor over stringers should last at least five years; the life of the steel or combination of wood and steel should be over twice that; but the price is many times that of the wood floor.

Many tests were conducted at the plant of the Pullman-Standard Car Manufacturing Company on the strength of different combinations of wood floor thickness and steel floor stringers. These proved to be erratic. For subsequent tests the fixture on which the test floors were mounted was rebuilt with underframe members spaced more realistically to represent the actual dimensions of a box car. The loads were applied in the direction that would occur on the car. By that is meant on the short 3-ft. span the wheel load was placed parallel to the length of the floor board such as would take place in the doorway of a car. In the panels where the cross-members were spaced 4 ft. apart, the wheel load was applied longitudinally of the car as if a lift truck were running between the crossbearer and the bolster.

The effect on strength of changing the lumber thickness on the various stringer combinations is shown in the accompanying graph.

The following basic facts are presented as a result of the tests conducted and calculations made: (1) The use of fir flooring versus yellow pine (based at 100 per cent) reduces lumber strength to 73 per cent; (2) the use of fir flooring versus yellow pine reduces floor stringer strength to 99 per cent; (3) the use of high-strength steel (similar section and strength as open-hearth but reduced thickness) versus open-hearth steel reduces lumber strength to 75 per cent; (4) the use of high-strength steel (similar section and strength as open-hearth but reduced thickness) versus open-hearth steel maintains stringer strength at 100 per cent; (5) the use of high-strength steel versus open-hearth steel (equal sections) floor stringers keeps lumber strength at 100 per cent; (6) the use of high-strength steel versus open-hearth steel (equal sections) floor stringers increases stringer strength to 164 per cent; (7) non-continuous stringers versus continuous stringers reduces stringer strength to 64 per cent; (8) non-continuous stringers versus continuous stringers reduces lumber strength to 56 per cent; (9) removing crosstie at center line of car reduces stringer

strength to 64 per cent; and (10) removing cross-tie at center line of car reduces lumber strength to 69 per cent.

From the data submitted, it is apparent that flooring of substantial strength is obtained with a 2⅝-in. wood floor laid on four 3-in. 6.7-lb. floor stringers (two each side of center sill) for an approximate additional expenditure over standard A.A.R. construction of $67 per car set. Several railroads are using four 4-in. 8.2-lb. Z floor stringers (two each side of center sill) to further increase floor strength.

Welding Cast Steel

A procedure for welding high-tensile steel castings has been approved by the Committee on Car Construction and the Committee on Couplers and Draft Gears. The joint subcommittee has prepared specific suggestions for modifications of coupler specifications and reclamation practices shown in Sec. C of the Manual and recommends, for submission to letter ballot, that a new Sec. D be added to the fusion welding and bronze welding limits and regulations (Manual pages L-3 to L-8F and Interchange Rule 3).

Passenger-Car Designations

The committee has reviewed the classifications for passenger cars shown in Section L of the Manual and considered changes recommended by the American Railway Car Institute. It recommends for submission to letter ballot changes in the designations and definitions of passenger-train cars to eliminate portions pertaining to equipment no longer in use and to simplify definitions.

Insect Infestation of Box Cars

The railroads have been requested to improve their car inspection and cleaning programs to comply with recommended standards for openings at bottom of side linings of box cars, for removal of debris and infestation from behind end linings of box cars and to consider possible redesign of box cars to eliminate spaces behind linings which are not self clearing. Information developed by a questionnaire sent to member roads by the Mechanical Division has been made available to the joint subcommittee. This includes various methods employed by individual railroads to deal with infestation of box cars, particularly as to the use of Fiberglas and other materials behind end linings.

The Car Construction Committee is of the opinion that an opening should be left at top and bottom of side lining so that the space behind it can be thoroughly cleaned. The top lining board should be left open only where there is a clear opening from top to bottom between the inside lining and outside lining. The subject is still under active consideration.

The members of the committee are J. A. Gower (chairman), assistant mechanical engineer, Pennsylvania; R. B. Winship, mechanical engineer, Canadian National; J. McMullen, consulting engineer, Erie; R. D. Bryan, mechanical assistant, Santa Fe; R. H. Graff, assistant engineer, car equipment, New York Central system; F. J. Herter, engineer car construction, Chesapeake & Ohio; H. L. Holland, assistant mechanical engineer, Baltimore & Ohio; N. A. Passur, engineer car construction, Southern Pacific; M. C. Haber, general mechanical engineer, Union Pacific; F. G. Moody, superintendent car department, Northern Pacific; K. H. Carpenter, superintendent car department, Lackawanna; W. A. Pownall, assistant to general superintendent motive power, Wabash; W. F. Kascal, mechanical superintendent Texas & Pacific.

Discussion

H. D. Fenske, assistant vice-president, Great Lakes Steel Corporation, in commenting on the freight-car-floor tests reported by the committee, said that these are static load tests and are not representative of the dynamic loads which car floors receive in service. Last summer, he said, dynamic tests were made at Altoona, Pa., by the Pennsylvania, and he suggested that the committee make dynamic tests of its own. He said that the cost and expense of car floors are relative and that the comparative economics of the steel and wood floors must be determined by a comparison of the total cost over the life of the car.

Cyrus J. Holland, president, Holland Company, said that the truck tests which were conducted by the committee during 1948, '49 and '50 have shown the necessity for long-travel springs. He reviewed the history of A.A.R. spring devlopments, including the 1915 standard 1-11/16-in. travel spring; the 1936 spring with 1⅝ in. travel; the 2½-in. travel spring, and the 3-1/16-in. travel spring of 1947, and the 3-11/16-in. travel spring of 1948. Thus, he pointed out, there are in use today five different designs of outer and five different designs of inner coil. This, he thought, should be simplified. He briefly described the Holland Constant Effective Static Deflection spring. This is a spring, the outer coil of which is made of a specially tapered bar with which is used a conventional inner coil helical spring. This spring, he said, will carry any load from empty to fully loaded car. With it, he said, it would be unnecessary to have special cars assigned to high-speed merchandise service with lighter capacity spring groups. This spring, he said, was tested in the 1950 road tests of the Cooperative Freight Car and Snubber Research program on several runs which demonstrated that it gave a satisfactory ride for the 169,000-lb. load up to 65 m.p.h., the 145,000-lb. load up to 90 m.p.h., and gave the lowest number of .5G and .75G shocks under the light load up to 90 m.p.h. of any comparable tests. Mr. Holland suggested that the subcommittee on springs investigate the benefits that could be attained by the use of this spring, which, he said, can be used in place of the present standard springs for reducing the number of spring designs needed.

(The report was accepted and referred to letter ballot.)

Lubrication of Cars and Locomotives

It has been decided that until it may be possible to formulate an A.A.R. specification for journal roller-bearing greases, it would be entirely consistent to approve certain greases which meet specified requirements considered necessary by your committee and which would pass compatibility tests. On the basis, the following greases have now been approved: Lubrico M-1, Special, the Master Lubricants Company; H-927 Non-Fluid Oil, the New York & New Jersey Lubricant Co.; No. 979 Roller Bearing Grease, the Texas Company.

Recommendation has been forwarded to the arbitration Committee to eliminate the present note following Sec. (k), Interchange Rule 66-A and, in lieu thereof, including the current list of approved greases for lubricating journal roller bearings.

Journal-Box Lids

Since the last annual meeting, the Joint Subcommittee on Journal-Box Lids has recommended that certificates of approval be granted for seven lids of the 5-in. by 9-in. and 5½-in. by 10-in. sizes, and 5 lids of the 6-in. by 12-in. size. Certificates have been granted and the lids shown in the list of Approved Journal Box Lids issued periodically by the secretary. Of these, 12 lids changes were required in 3 before approvals were granted.

Six requests for minor changes in design under existing certificates were granted. Two similar requests were rejected as the changes requested were such that parts manufactured under the new drawings would not be interchangeable with parts manufactured under drawings included in the original certificate of approval.

The subcommittee is also active in an effort to have lid manufacturers submit lids, in the 6½-in. by 12-in. size for approval in order that member roads may comply with Interchange Rule 3, Sec. j (3), which reads as follows: "Journal-box lids complying with A.A.R. Specifications for Journal-Box Lids as revised in 1947 and having A.A.R. Certificate of Approval are required on all cars built new or rebuilt after January 1950, from owners."

At a meeting on June 22, 1949, the committee agreed to conduct a series of vibration tests on journal-box lids to obtain information on the relative wear of the lid eyes, hinge pins and the holes and lug faces of the box.

Tests of Journal-Box Closures

Service tests of various combinations of journal-box closures have been continuing. One road which is testing 50 cars having the front face of the journal box planed smooth, journal-box hinge lugs in good condition and journal box equipped with deep-flange lid, reports that from the time of such installations in September 1949 until February 9, 1951 (date of reporting), no hot boxes have been experienced on any of these cars. In addition, an analysis of the waste in these boxes was made on three different occasions during this period and the highest moisture content was 1.84 per-

cent and the highest impurities content was 1.24 percent. On the basis of this performance, a suggestion was before the committee to recommend a requirement that the front face of journal boxes on all cars built new be planed smooth and that the hinge lug be equipped with wear plates both on the face and in the hinge-pin hole.

The committee felt that with close checking at the manufacturing plants, truck sides with integral journal boxes, or separable boxes, can be obtained with face within the present tolerances of 1/32 in., or even closer, which are considered satisfactory for freight service.

The following packing-retainer devices have been approved for roads desiring to use them; Hold-Rite packing retainer NP-8, 9 and 10, 11 and 12, Spring Packing Company; Modern Packing Keeper 8-9-10-11-12, Modern Railway Devices Company; Union waste retainer 9, 10, 11, Union Spring & Manufacturing Co.; Flex-Pak package-type waste container, 5 in. by 9 in., 5½ in. by 10 in., 6 in. by 11 in., the Hudson Company.

Quite a number of installations have been made by an eastern rialroad of the so-called "Hogan Anti-Waste Roll Ledge." The committee has arranged for inspections to be made of such installations and also to obtain data, where possible, regarding the performance of cars so equipped.

Hot-Box Statistics

Effective July 1, 1950, the General Committee directed that information again be collected covering the number of freight cars set off between division terminals because of hot boxes, and the number of miles run per hot box set off. The tabulation of this information again was considered necessary because of the number of hot boxes occurring last summer.

While the committee feels this basis will not permit consistent comparison between a high-speed, multiple-track railroad and a slower-speed light-traffic railroad, it will nevertheless afford a basis of comparison by each railroad with its own former performance and stimulate action for improvement by roads which might not have as good a performance as previously. The reporting form has been modified, however, so as to require the least amount of data from the reporting roads necessary for this report.

During the year a series of colored motion pictures were taken at the Indianapolis Lubrication Laboratory to record waste-pack displacements within the journal box after overnight freezing down at the —15 deg. F temperature range.

The Mechanical Inspection Department has been directed to obtain samples of journal-box packing in use by the railroads, private car owners, car builders and contract repair shops, and to arrange for the necessary laboratory analyses to determine if packing meets all the requirements of the specifications.

Axle Stop Dust Guard

A device known as the Axle Stop Dust Guard is intended to prevent unseating the journal bearing from the journal of freight or passenger cars or locomotive tenders, through rough switching or application of brakes. The committee has agreed to observe the performance of this device which has been installed in cars and locomotives of certain roads represented on the committee.

On the basis of the information and experience established up to the present, the principle involved in this device appears to have possibilities which may eliminate some of the causes of lubrication failures. If and when additional installations are made by interested roads, however, more experience in connection with the use of this device can be obtained.

Cotton Fabric Dust Guards

Under date of October 19, 1950, the U. S. Department of Agriculture advised that one of its research laboratories had developed a means of weaving an abnormally dense cotton fabric and that a number of thicknesses of this type fabric had been fabricated into a dust guard which might be acceptable as an alternate for present designs of dust guards in service.

Test samples were obtained of these cotton fabric dust guards and submitted to laboratory tests, three of the guards having the plies stitched together and three stapled with rust-resistant staples. Tests showed that both guards mushroomed at the axle opening, and the staple guard buckled at the corner and would have eventually turned around in the pocket. Both guards show indications of fraying out at the axle opening, and the danger of the cotton strands becoming loose and entering the journal box is very apparent. This is receiving further consideration by the committee.

Mention was made of the National Dust Reflector Housings in the 1950 report of this committee. Trucks having National Dust Deflector Housings have now been installed in Merchants Dispatch Transportation Corporation cars Nos. 10990 to 10999, inclusive.

A.A.R. Lubrication Manual

The A.A.R. Lubrication Manual was adopted as standard in 1949 and became effective on January 1, 1950. Like all new publications regarding rules, standards and recommended practices, the first edition was by no means perfect. It was, however, a start in a matter of extreme importance to all railroads and all car owners.

A thorough revision has been proposed and after further consideration is given to this matter jointly by the Lubrication and Arbitration Committees, it is quite certain that we will have an improved publication which will be more definite insofar as standard details and recommended details are concerned, and which will be more useful to the railroads and the private car owners.

During the year, in collaboration with the Solid Bearing Manufacturers' Technical Advisory Committee, the subcommittee has carried out the authorized plan of conducting road tests of bearing design modifications, to be used in association with axles with and without end collars. A two-week's program, utilizing the American Steel Foundries five-car service laboratory, operated as a special train over Illinois Central rails between Clinton and Gillman, Ill., was underwritten by the Magnut Metal Corporation and the National Bearing Division, American Brake Shoe Company. The results of this road testing research program have been published by the Mechanical Research Office in two reports, as follows: Report No. f3000—Investigation of Railway Equipment Journal Bearing Performance, dated December 15, 1950; report No. f4000—Lateral Action of Freight Car Trucks, dated December 28, 1950.

These two progress reports have been distributed to the several interested committees and the Solid Bearing Manufacturers' Technical Advisory Group as information, but to date have not been made available for general distribution.

Iron-Back Journal Bearings

As indicated in several circular letters issued by the secretary of the Mechanical Division, a new type of journal bearing has been developed, designated the "Laudig" iron-back journal bearing. The purpose intended for this new type of journal bearing is to lessen the possibilities of journal failures caused by hot boxes.

Approval for service tests of 100 cars equipped with "Laudig" iron-back journal bearings in interchange service has been authorized, and total installations had been made to 87 cars at the time this report was printed.

Complete instructions with respect to the road service tests these journal bearings are contained in circular letter issued November 30, 1950, by the secretary of the Mechanical Division.

Journal-Lubricating Device

Essential details of the Empire journal lubricator are shown in the drawing. This design employs a pair of ball-bearing rollers (oil impervious composition) held against the bottom of the journal through spring tension (piano wire) to replace the conventional waste-pack. The rollers provide semi-bath mechanical lubrication. An oil seal of composition material to withstand the action of oil takes the place of the conventional dust guard.

Laboratory tests of this device have been made at the Indianapolis Lubrication Laboratory under the jurisdiction of the A.A.R. Mechanical Engineer and a report with respect to same has been furnished to your committee. The laboratory tests indicated that this lubricator can be rated as a satisfactory device for the lubrication of conventional railway solid journal bearings.

The committee has decided that road service tests of a sufficient number of these lubricators should be conducted to establish the mechanical reliability and overall economics of this device as a basis for possible approval of its use under cars in interchange.

Installations have been made in different types of cars on six railroads and representatives of the committee have arranged to make periodic inspections of such installations from time to time to determine their service performance. Up to the present time, however, no definite recommendations have been offered.

The report was signed by Chairman R. E. Coughlan, chief metallurgist and engineer tests, Chicago & North Western, E. H. Jenkins (vice-chairman), assistant general superintendent car equipment, western region, Canadian National; A. J. Pichetto, general air brake engineer, Illinois Central; D. C. Davis, lubrication supervisor, Santa Fe; M. A. Pinney, engineer of tests Pennsylvania; H. T. Rockwell, assistant engineer, New York Central; M. A. Hansen, engineer of research, Gulf, Mobile & Ohio; F. Fahland, research & standards engineer, Union Pacific; Robert Schey, general superintendent car department, Nickel Plate; L. N. Griffith, assistant mechanical engineer, Southern Pacific; W. R. Petry, chemist, Great Northern.

Discussion

G. R. Andersen, superintendent car department, C. & N. W., said that his road was planning for a lubrication test in which one half of the journal boxes of 100 hopper cars will be lubricated with a low-viscosity oil of high film strength and the other half of the journal boxes will be lubricated with the regular oil. These cars will be retained on the home line.

During the meeting several members, speaking on this and other reports, referred to the necessity of strict observance of the rules with respect to attention to journal bearings and the journal boxes. Failures to do this were emphasized as one of the causes of recurring hot-box trouble.

(The report was accepted.)

Hot Box Alarm Devices

The principal activity of the committee has been to review devices submitted by individuals and manufacturers, and continue observation of the devices undergoing road service tests. At a meeting on May 3, a suggestion was submitted for employing a bolometer, or electronic radiation type of detector. The bolometer would be located along the track and is supposed to indicate the presence of overheated journals on cars passing a given point. A subcommittee has been appointed to investigate the possibilities and economics of this device.

Road Service Test Program

Of the four hot box alarm systems or devices approved for road service demonstration, two remained in service during the past year. The following tabulation shows the results of the service tests of the two devices from the date of the original application to March 31, 1951.

Alarm equipment	Service months	True indications	False alarms	Possible False alarms	Failures	Equipment defect
Pennsylvania cartridge	59	12	16	1	4	37
Magnus Metal Twin Plex	52	3*	1	0	0	17

* In the 1950 report these three instances were listed under "Failures." After review of reports covering these cases, the committee changed the classification as listed above on the premise that the records showed in all cases at least one of the bombs was discharged, but train crew failed to detect. Both tests were erminated during the past year.

	Number of cases 39,000, friction bearings	19,960 roller bearings	Total
(1) One or both alarm cartridges functioned, noted by train crews or others, overheated bearing found and proper action taken	15	5	20
(2) Overheated bearing found by inspectors at station stops; one of both alarms functioned in each case, but no action taken by train crew ..... In most of these cases bearing was in process of overheating with alarm cartridges only partially discharged when discovered. In at least 11 cases both alarms had fully discharged, giving train crews full warning	28	3	31
(3) False alarms: Noted by train crew, 1; by test engineer at station stop, 1 ..... In both of above cases journals had obsolete odor cartridge only.	0	2	2
(4) Failure to function—bearing found overheated at station stop. Obsolete smoke and odor cartridges	0	1	1
Total on Trains en Route	43	11	54

(Four appendixes included with the report gave complete data on the service results on both devices.—EDITOR)

Member-Road Service Experienced

The New York Central furnished the following report of experience on trains en route with the Twin Plex Hot Box Alarm:

In furnishing the committee wih the above statistics it was stated: "There might have been circumstances under Item (2) in which the train crew apparently failed to take any action. The fact that in no case were the consequences serious would indicate that failure to take action may have been prompted by the knowledge that train was sufficiently close to a scheduled stopping point to make such action unnecessary.

"In addition to reports covering trains, as summarized above, a substantial number of reports were received listing partly discharged or leaking alarm cartridges found on cars at terminals and in yards. These are not included here because complete information was lacking in many cases as to whether the bearings in which these leaking or partly discharged alarm cartridges were found showed evidence of overheating or not. This was difficult to determine because Satco lining metal does not begin to melt until it reaches 585°F. Therefore a bearing might have been heated to say 450°F., well above the 350°F. temperature at which the alarm discharges, and yet when cold show no superficial evidence of having been overheated. Unfortunately, most of these bearings were destroyed before the question of whether they had been overheated could be determined to the satisfaction of all concerned." (A detailed record of 59 cases was included in an appendix.—EDITOR)

The Fenwal Journ-A-Larm System

As of August 20, 1950, Southern Pacific has had 185 cars, including sleepers, operating with Fenwal Journ-A-Larm system. Eighty-nine of these cars have been in service since May 1, 1950. All of these cars are equipped with roller bearings.

A number of false hot-journal alarm indications have been experienced since May 1950. These false indications were not confined to any particular train or territory, nor were they confined to any particular type of car. The majority of false alarms were caused by (a.) defective control switches on the alarm control, (b.) defective operation of timers operating the solenoid alarm valves, and (c.) internal breaking of leads inside the head of the thermoswitch. A relatively few other defects resulted in false alarms.

The experience gained with the Fenwal system for the past year has revealed certain weaknesses in the present system. These weaknesses could be determined only by thorough and continued use of the device in actual service on a large number of cars. The manufacturer has initiated a development program for the purpose of providing a basically new system for detection of overheated roller-bearing journals. The changes will be principally in the alarm panel located in the car electric locker and the thermoswitches. The present car-journal alarm wiring will remain practically unchanged. The circuit arrangement for the new system will be a normally open circuit with an automatic checking feature. About 10 or 12 cars will be equipped with the new device later in 1951 for road service tests.

On February 15, 1951, the journal alarm system functioned as intended indicating a hot journal on a sleeping car on Train 3 at Planeport, Texas. It was necessary to cut the car out of the train at El Paso approximately six miles from Planeport.

The Fenwal Jour-A-Larm system employed by the Southern Pacific is generally classified as a relatively expensive, electric type, applicable to passenger cars only. It is obvious that this device is still in the development stage, but that progress is being made in overcoming some of the service defects encountered in the original installations of the device on this railroad.

Members of the committee are J. R. Jackson (chairman), mechanical engineer, Mechanical Division, A.A.R.; M. A. Pinney, engineer of tests, Pennsylvania; H. L. Holland, assistant mechanical engineer, Baltimore & Ohio; J. Stair, Jr., electrical engineer, Pennsylvania; H. T. Rockwell, assistant engineer, New York Central; L. H. Sultan, electrical engineer, Southern Pacific.

(The report was accepted.)

Coordinated Association Programs

Five mechanical associations and the A.A.R. Electrical Sections will hold meetings and exhibit at Chicago, September 17 to 19

BEGINNING Monday, September 17 the Coordinated Mechanical Associations and the Electric Sections, A.A.R. Mechanical and Engineering Divisions, will hold a three-day meeting in Chicago. The mechanical associations are the Air Brake, Master Boiler Makers', Car Department Officers', Fuel and Traveling Engineers and Locomotive Maintenance Officers. The meetings of these five groups will be held at the Hotel Sherman and the meetings of the Electrical Sections, with the exception of a joint meeting with the L.M.O.A., will be held at the Hotel La Salle. There will be an exhibit of mechanical products at the Hotel Sherman under the auspices of the Allied Railway Supply Association, Inc. All of the mechanical associations have arranged their programs so that the afternoon of Tuesday, September 18, will be free for the members to inspect exhibits.

The officers of the coordinating committee of the Coordinated Mechanical Associations consisting of the presidents and secretaries of the railway associations and the exhibiting organization are: Chairman, A. K. Galloway, general superintendent motive power and equipment, B. & O.; vice-chairman, J. P. Morris, general manager, mechanical department, A.T. & S.F.; vice-chairman, George Bohannon, chief mechanical officer, C. & N. W.; secretary, C. F. Weil, American Brake Shoe Co. B. S. Johnson of W. H. Miner, Inc., is president of the Allied Railway Supply Association and C. F. Weil is secretary-treasurer of the supply association which, this year, is in charge of the exhibit. The programs of the several associations appear on this and following pages. Central Daylight Saving Time is given throughout.

Railway Fuel and Traveling Engineers' Association

MONDAY, SEPTEMBER 17

10 A.M.

Address by President G. E. Anderson, general fuel supervisor, Great Northern

Coal—Steam Locomotives, by C. M. Moddrell, supervisor fuel and locomotive performance, Northern Pacific

Locomotive Fuel Oil, by T. J. Conway, fuel supervisor, Texas & Pacific

2 P.M.

Employee and Public Relations on the Railroads, by L. W. Horning, vice-president personnel and public relations, New York Central system

Passenger Train and Freight Train Handling—Dynamic Braking, by F. T. McClure, general supervisor air brakes, Atchison, Topeka & Santa Fe (In joint meeting with Air Brake Association)

Water Treatment—Steam and Diesel Locomotives, by I. C. Brown, chief water engineer, St. Louis-San Francisco

TUESDAY, SEPTEMBER 18

9 A.M.

Diesel Fuel Oil—Loss of Fuel, by O. D. Teeter, fuel supervisor, Denver & Rio Grande Western

Address by E. H. Davison, director, Bureau of Locomotive Inspection, I.C.C.

Operation of Fairbanks Morse Diesels, by R. D. Nicholson, road foreman, New York, New Haven & Hartford

Education of Locomotive Operating Personnel, by G. B. Curtis, road foreman of engines, Richmond, Fredericksburg & Potomac

Avoidable Train Delays with Diesel Power, by W. H. Fortney, chief road foreman of engines, New York Central

WEDNESDAY, SEPTEMBER 19

9 A.M.

Operating Difficulties Encountered on Line of Road, by W. H. Powell, supervisor of locomotives, operation, Baltimore & Ohio

Gas Turbine Locomotives, by R. A. Williamson, manager, railroad rolling stock division, General Electric Co.

Steam Generators—Elesco and Clarkson Vapor, by F. Thomas, assistant to general superintendent of equipment—diesels, New York Central system

Election of officers

2 P.M.

Safety in Train Operation

Air Pollution, by Glenn Warner, fuel supervisor, Pere Marquette district, Chesapeake & Ohio

Air Brake Association

MONDAY, SEPTEMBER 17

10 A.M.

President's address
Secretary's report
Miscellaneous

Inspection and Testing of 24-RL Equipment—Central Air Brake Club, John Mattise (chairman) Chicago & North Western

2 P.M.

To Obtain a Higher Efficiency in Air Brake Service, S. L. Williams, Westinghouse Air Brake Co.

Freight and Passenger Train Handling and Dynamic Braking, F. T. McClure (chairman), Atchison, Topeka & Santa Fe (In joint meeting with Railway Fuel and Traveling Engineers' Association)

TUESDAY, SEPTEMBER 18

9 A.M.

Effects of Air Leakage in Freight Trains, by H. N. Sudduth, New York Air Brake Co.

Clasp Brake Maintenance, H. I. Tramblie (chairman), Chicago, Burlington & Quincy

Report of Approved Maintenance Practice Committee, F. W. Dell (chairman), Grand Trunk Western

WEDNESDAY, SEPTEMBER 19

9 A.M.

24-Rl Brake Equipment—St. Louis Air Brake Club, E. W. Erisman (chairman), Wabash

No. 6 Type of Brake Eqipment for Diesel Electric Switching Locomotives, Manhattan Air Brake Club, L. D. Hays (chairman), New York Central

Removal of Moisture from Yard Charging Plant Air, Pittsburgh Air Brake Club

2 P.M.

Unfinished business—Committee Reports
Election of officers
Presentation of Past President's badge

Car Department Officers' Association

MONDAY, SEPTEMBER 17

10 A.M.

Address by President J. A. Deppe, superintendent car department, Chicago, Milwaukee, St. Paul & Pacific

Address by J. P. Kiley, president, Chicago, Milwaukee, St. Paul & Pacific

Report on Wheel Shop Practices, by E. E. Packard, district master car repairer, Southern Pacific

2 P.M.

Report on A.A.R. Loading Rules. A. C. Bender, (chairman), joint supervisor car inspection, Cleveland Car Inspection Association

Report on Interchange and Billing for Car Repairs. J. J. Sheehan (chairman) supervisor car repair bills, Missouri Pacific

Report on Air-Conditioning Equipment—Operation and Maintenance, R. F. Dougherty (chairman), general electrical & air conditioning inspector, Union Pacific

TUESDAY, SEPTEMBER 18

9 A.M.

Report on Analysis of Train Yard Operations—Inspection and Maintenance of Air Brakes, W. B. Medill (chairman), master car repairer, Southern Pacific

Address by G. J. Willingham, director of personnel, Illinois Central

Report on Car Lubrication, K. H. Carpenter (chairman), superintendent car department, Delaware, Lackawanna & Western

WEDNESDAY, SEPTEMBER 19

9 A.M.

Report on Inspection, Conditioning and Repairing Cars for Higher Commodity Classification, T. E. Hart (chairman), chief car inspector, New York, Chicago & St. Louis

Report on Cleaning and Painting Materials for Refinishing Passenger Equipment, E. M. Driscoll (chairman), foreman painter, Chicago, Milwaukee, St. Paul & Pacific

Election of officers

Master Boiler Makers' Association

MONDAY, SEPTEMBER 17

9:15 A.M.

Message, Association President R. B. Barrett

Message, D. V. Gonder, assistant to vice-president, Canadian National

Topic No. 2—Procedure for the fabrication of all-welded locomotive, stationary and portable boilers. Advantages of all-welded boilers vs. riveted boilers as experienced to date, George M. Davies (chairman), assistant engineer, locomotive equipment, New York Central system

Message, Secretary-Treasurer A. F. Stiglmeier

2 P.M.

Report of the Executive Board

Topic No. 1—Fabrication and erection of modern stationary boilers, with moving pictures. Advantages of chemically descaling stationary and portable boilers, with moving pictures. Stanley F. Wentz (chairman), assistant supervisor of boilers, New York Central

TUESDAY, SEPTEMBER 18

9 A.M.

Message, J. P. Wadsworth, superintendent of safety, Canadian National

Topic No. 3—With the use of approved chemicals in locomotive feedwater for the purpose of reducing the blowdown and carrying higher solids in boiler water. What, if any, adverse and detrimental effects are experienced from these increased solids? F. E. Godwin, (chairman), mechanical inspector, Canadian National

Election of officers

Report Committee on Law

WEDNESDAY, SEPTEMBER 19

9:15 A.M.

Report Committee on Memorial

Message, Edward H. Davidson, director, Bureau of Locomotive Inspection, Interstate Commerce Commission

Topic No. 4—Proper procedure to be followed in the maintenance and testing of stationary and portable air reservoirs other than locomotives and cars. Care and maintenance of stationary and portable boilers. Harry C. Haviland (chairman), supervisor of boilers, New York Central

Topic No. 5—What effect do pounds, broken frames and stuck or gauled expansion shoes have on boiler maintenance. A. A. Edlund (chairman), assistant general boiler inspector, Chicago, Milwaukee, St. Paul & Pacific

2 P.M.

Report Committee on Resolution

Topic No. 6—Procedure for washing and testing steam generators on locomotives other than steam. What improvements can be made to abate corrosion on steam generator coils. What improvement can be made to abate electrolytic action and corrosion on heating boilers of electric locomotives. S. H. Christopherson (chairman), supervisor of boiler and welding inspection, New York, New Haven & Hartford

Locomotive Maintenance Officers' Association

MONDAY, SEPTEMBER 17

10 A.M.

Address by President P. H. Verd, superintendent motive power and equipment, Elgin, Joliet & Eastern

Address by F. K. Mitchell, manager of equipment, N.Y.C. system

2 P.M.

Report of Committee on Winterization of Diesel-Electric Locomotives, F. Thomas (chairman), assistant to general superintendent equipment—diesel-electric, New York Central system

Report of Committee on Personnel Training, E. V. Myers (chairman), superintendent, St. Louis-Southwestern

Report of Committee, Diesel Mechanical, L. I. Luthey (chairman), general supervisor of diesel engines, A. T. & S. F.

1. Air filters
2. Extension of inspection periods
3. Water and oil leaks

TUESDAY, SEPTEMBER 18

10 A.M.

Report of Committee on Shop Practices, C. H. Spence (chairman), superintendent of shops, Baltimore & Ohio

1. Repairing diesel locomotive trucks
2. Welding on diesel locomotive work
3. Servicing steam power at terminals

Report of Committee on Shop Tools, F. E. Molloy (chairman), superintendent of motive power, Southern Pacific

WEDNESDAY, SEPTEMBER 19

9 A.M.

Report of Committee on Diesel Material Reconditioning and Control, W. R. Sederquest (chairman) superintendent locomotive maintenance, New York, New Haven & Hartford

Report of Committee on Diesel Terminal Facilities, H. H. Niksch (chairman), master mechanic, Elgin, Joliet & Eastern

1. Centralized reconditioning facilities
2. Cleaning diesel locomotives
3. Wayside facilities

2 P.M.

Joint session with Mechanical Division, Electrical Section

Address by E. H. Davidson, director, Bureau of Locomotive Inspection, Interstate Commerce Commission

Report of Committee on Cleaning and Testing Electrical Equipment, W. P. Miller (chairman), superintendent diesel and motor car equipment, Chicago & North Western

Electrical Sections—A.A.R. Mechanical and Engineering Divisions

MONDAY, SEPTEMBER 17

10 A.M.

Address by H. F. Finnemore (chairman, Engineering Division), chief electrical engineer Canadian National

Address by L. C. Bowes (chairman, Mechanical Division), electrical engineer Chicago Rock Island & Pacific

Unfinished and new business (Mechanical)

Election of officers (Mechanical)

ENGINEERING DIVISION

Report Joint Committee Wire, Cable and Insulating Materials,

Report of Joint Committee on Power Supply

2 P.M.

ENGINEERING DIVISION

Report of Committee 2—Electrolysis

Report of Committee 3—Overhead Transmission and Catenary Construction

Report of Committee 9—Track and Third Rail Bonds

Report of Committee 10—Illumination

MECHANICAL DIVISION

Report of Committee on Application of Radio and Communicating Systems to Rolling Stock

Report of Joint Committee on Electrical Facilities and Practices for Repair Shops

Report of Committee on Wiring Diagrams for Rolling Stock

TUESDAY, SEPTEMBER 18

9 A.M.

ENGINEERING DIVISION

Unfinished business

New business

Report of Committee 11—Electric Heating

MECHANICAL DIVISION

Report of Joint Committee on Welding and Cutting

Report of Committee on Car Electrical Equipment

WEDNESDAY, SEPTEMBER 19

9 A.M.

MECHANICAL DIVISION

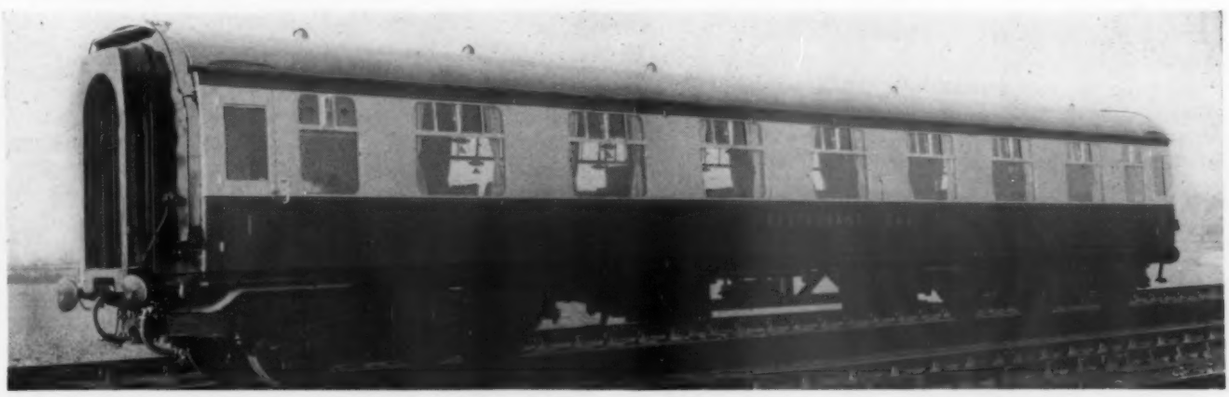
Report of Committee on Car Air-Conditioning Equipment

2 P.M.

MECHANICAL DIVISION

Report of Committee on Automotive and Electric Rolling Stock (In joint session with L. M. O. A.)

* * *



New standard all-steel passenger cars for the British Railways have automatic couplers with retractable side buffers for use with screw-coupling cars

ELECTRICAL SECTION

Two-unit 4,000-hp. diesel-electric locomotive hauling a passenger train up a 1.8 per cent grade in the Lehighton-Mauch Chunk area on the Lehigh Valley

Carbon Brushes Must Carry Peak Loads

High efficiency, uniform dependability and maintenance of optimum commutator condition are more important than long brush life

*By C. P. Turner**

THE 1,246-mile Lehigh Valley operates over some of the steepest mountain grades in the eastern United States, centered principally among the anthracite fields of Pennsylvania. Its 448 miles of main line between the Niagara frontier and New York City follow the winding course of the Susquehanna, Lehigh and Raritan Rivers for several hundred miles.

A primary problem which the engineering and operating personnel have had to solve arises from the constant punishment undergone by locomotives assigned to negotiate the curves not only at sea level, but up and down the steep grades. Following an exhaustive survey, Lehigh Valley management determined that operating expenses could be reduced considerably through conversion from a steam-powered railroad to one of diesel operation. This involved not only a complete change-over from traditional railroading but it meant huge capital outlays for new terminal and servicing facilities, as well as a re-education of personnel. Today, all main line freight and passenger service is fully dieselized, and it is expected that the operations will soon be 100 per cent dieselized.

A diesel-electric locomotive, due to the complexity of its mechanical-electrical system, discourages any inference that one part of it is more important than another. The finest locomotive power plant is of no value unless its power is delivered to the wheels. Consequently, close attention must be directed to the proper operation of traction motors. Dependable motor operation relies, to a great extent, on good commutation and brush performance.

*System Supervisor, Diesel Operation and Maintenance, Lehigh Valley

Locomotives on the Lehigh Valley are operating at either extreme of service most of the time; that is, they are either pulling at peak effort while climbing a grade, or coasting down the other side before reaching another upgrade. Either extreme taxes the abilities of the diesel-electrics and challenges the "feel" of the engineer and proves his ability in handling the controls with fine precision to coax the last ounce of power out of the locomotive. The fact that the Lehigh Valley roadbed has served as a proving ground for many other railroads in testing their diesel-electric locomotives over rugged terrain, is an indication of the robust topography traversed by the Lehigh and a decided victory for locomotives whose stamina makes such runs daily routine. With passenger and freight service totaling nearly four and a half million miles and another three and a half million miles of switching service annually, a concrete idea is provided of the enormity of the task of keeping 187 diesel-electric units running at high efficiency with an availability of some 93 per cent.

Despite the fact that freight trains are scheduled at speeds which only a few years ago were considered high even for passenger trains, the gap between passenger and freight train speeds is not narrowing to any great extent, due to passenger train speeds have risen almost proportionately with that of freight. Such a comparison further emphasizes the maximum performance demands placed on traction motor brushes that must function perfectly at high speeds, both under heavy pounding, and at peak loading. In proportion to the relative resistance of copper to carbon, traction motor brushes must carry current densities fifty to one hundred times in ratio to the armature winding, while rubbing on the commutator under a pressure of 9 to 12 lb. per brush, entirely without lubrication other than that provided by the brush itself. The surface speed reaches a peak of two miles a minute, yet there is practically no commutator wear.

There have been some instances of breakage and wear on brushes that have been more prevalent on the passenger locomotives than on the freight, though it would appear that the latter service is subject to greater stresses because of heavier loads. Some brush breakage has been experienced on the lead motor and the only plausible explanation is that, when the leading truck hits cross-overs and occasional wide rail joints at high speed, the resulting jolt causes the brushes to bounce excessively. The initial impact somewhat softens the blow for following trucks.

There have been occasional cases of the commutator wearing out-of-round on passenger locomotive motors without any apparent evidence of burning or copper pulling. This situation defied analysis for a while, but later corrected itself; thus, it was concluded that it was of an "epidemic" nature.

For the kind of operation the Lehigh Valley must live with, the selection of traction motor brushes has been simplified by the efforts extended by the manufacturer. Brushes now in use are strong to withstand high speed impacts and heavy hauling, yet at the same time, combine the required degree of commutating ability and proper friction coefficient to keep the commutators well polished. Precaution must be taken to see that the spring pressure is carefully adjusted and maintained to provide uniformly correct tension for good contact and resultant good commutation, at the same time holding the brush firmly to the commutator's surface with a minimum of jumping. Actual brush life does not constitute a primary essential. If the three essentials of high efficiency, uniform dependability, and maintenance of optimum commutator condition are achieved, reasonable brush mileage will follow.

No attempt has been made to restrict our use to any one manufacturer's brushes. Nevertheless, Grade AZY is the standard brush used on the D7, D17 and D27 type traction motors. This brush is longer-lived than previous specified grades.

It is unnecessary to establish a set schedule for brush changes on traction motors. Each locomotive unit receives an overall inspection every fifteen days, the condition and wear on the brushes being noted on the card affixed to each motor, and new brushes are installed when the old ones have outworn their usefulness.

Coupled with defects revealed after careful inspection as well as taking full cognizance of the manufacturer's recommendations, the armature may be completely torn down, new windings installed, and commutator and brush holders reconditioned, and the motor then again subjected to a thorough shop test before being assigned for duty. Undercutting the micas is standard practice. Under normal conditions, the brushes protect the commutator against frictional wear as well as damage from sparking. With a uniform gloss over the entire commutator surface, with neither raw nor burned spots or any high resistance glaze, commutator wear will be negligible item of maintenance and machine depreciation.

The only reason traction motor brush performance is now so satisfactory and trouble-free is that brushes are now available that combine good commutator factor, uniform dependability and a minimum of mechanical and electrical losses. These qualities are further combined with the capacity for carrying continuous peak loads without excessive heating and with long brush mileage.

W. D. Taylor, electrical engineer, Central Region, Canadian National Railways, on the left, stands in front of the Canadian-built C.N.R. diesel-electric road locomotive exhibited at the American Institute of Electrical Engineers' Summer General Meeting with F. L. Jones, supervisor of diesel equipment, Central Region, in Toronto, Canada, June 25, 1951

Load Tester For Motor Alternators

Left: The left end of the cabinet, showing the receptacles used for connecting the power supply and the machines on test. Right: The author with his load test cabinet

*By K. F. Gluesing**

THE DEVICE illustrated was developed for making load tests on all types of Safety motor-alternators up to 2 kw. capacity. It was built by the author under the supervision of A. E. Lines, departmental foreman of electricians, Los Angeles General Shops, Southern Pacific.

The test set incorporates a 200,000-ohm ground detector, a frequency meter, a kilowatt meter, a d.c. ammeter, a d.c. voltmeter, an a.c. voltmeter, and an a.c. ammeter. The load for the alternator is a 2,250-watt, Allen Bradley variable resistance which is mounted on top of the cabinet.

Through the opening at the right of the cabinet may be seen one of the starters for the newer type motor-alternators. Immediately above it, but not visible, is a starter for the older model machines. These starters are used to start the machines under test.

Below the meters are control switches, and on the end of the cabinet are receptacles for receiving d.c. power and for connecting the machines under test.

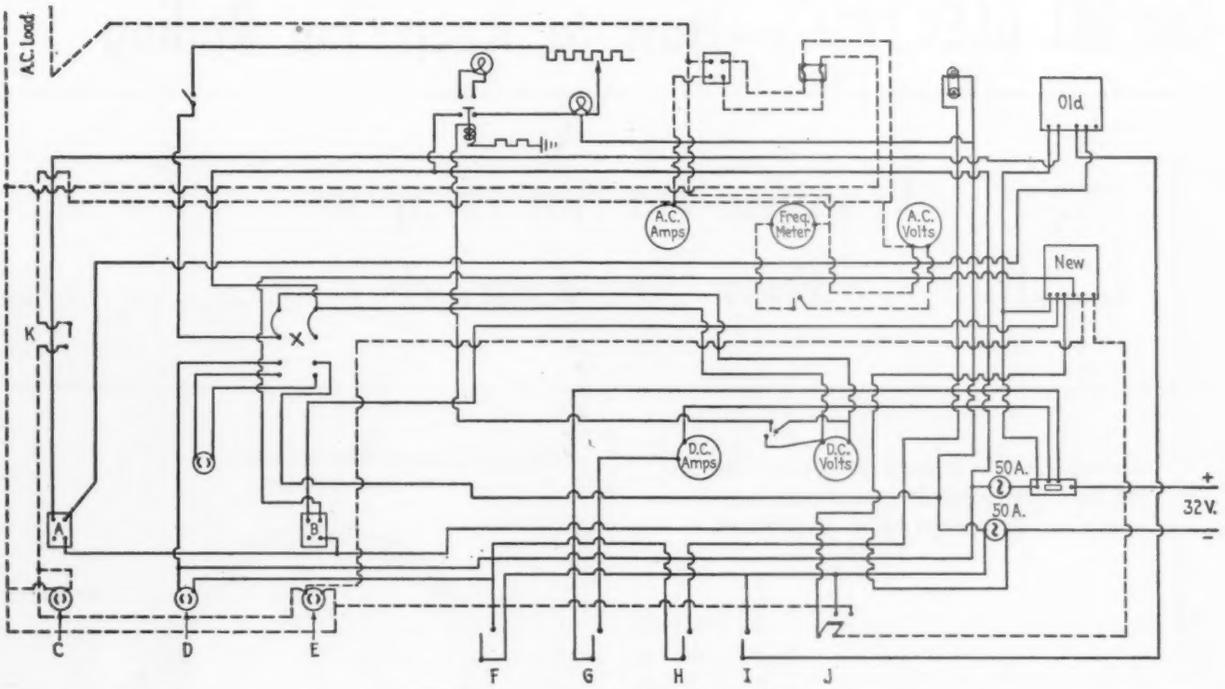
Referring to the diagram, 32-volt d.c. power is supplied to the receptable *D*. If a new type machine is to be tested, the a.c. terminals are connected to the load through receptacle *E*, and the d.c. terminals are plugged into receptacle *B*. Closing the switch *J* connects the d.c. end of the machine to the proper starter. Closing the switch *F* starts the machine. The a.c. load switch *K* is then closed and meter readings are taken while the machine is loaded on the rheostat.

The older type machines are connected to receptacles *A* and *C*, and are started by closing switches *I* and *F*.

By means of the double-pole, double-throw switch *X* on the d.c. voltmeter, it may be used to check the input voltage, as well as the rectifier output voltage and compensating resistor voltage drop.

The tester also has a separate circuit that is used to

* Electrician, Los Angeles General Shops, Southern Pacific Company, Los Angeles, Cal.



Wiring diagram for the load test cabinet

test all types of d.c. motors using full voltage or voltage in series with two 250-watt lamps. These lamps are used for testing series motors and are inserted into the circuit by leaving switch *F* open and closing switch *H*.

The device is portable, and can be taken from the bench to any part of the yards or shop. When used with a power factor meter with the a.c. car circuits as a load, it gives a true picture of the actual operating conditions of the alternator and fluorescent lighting on any tpye of car having such equipment.

General view of the Great Northern's Dale Street electrical repair shop in St. Paul, Minn.

DIESEL-ELECTRICS—How to Keep 'Em Rolling

2 Troubles Do Not Happen-- They Are Caused*

In which the theory and practice of lubricating traction motor suspension bearings are explained

MOTIVE power maintenance departments are faced with the problem of trying to keep pace with fast growing fleets of diesel-electric locomotives. This is a very different job than in the days of the first lone diesel on a steam road. Then it was a case of getting the job done somehow with the existing steam facilities and manpower. A vacant roundhouse stall between two steamers, or the cinder pit and an untrucked box car, had to serve as a shop. The steam-minded shop man with his heavy tools faced the exacting needs of the diesel engine, and the strange electric drive.

Today many railroads are hard at work on this problem. They are providing special diesel shops, and studying the best ways and means of maintaining this new form of motive power. Their efforts are spurred by the fact that the diesel is one of the most valuable and expensive tools ever placed in the hands of railroad men. Its operating economy makes railroad dieselization possible. Its cost requires that it be used to the fullest extent. It must be kept available for hauling trains and producing revenue. On the other hand, maintenance costs must be kept low since they are an important part of operating expense.

Getting in the Groove

On many roads, the diesels have operated long enough for the "newness" to wear off. Occasional attention has been replaced by scheduled maintenance. The "run them 'til they fail" or "let's see what they can do" kind of operation, ending in road failures and costly repairs, has had its day. The progressive maintenance system is now in favor because of its good results on many roads. It is, however, giving way to the preventive maintenance program with its regular service inspections and scheduled overhauls. The big aim of this change is to balance the cost of maintenance against the cost of locomotive failures and keep the total as low as possible. Engines standing over pits or in the backshop cannot pull pay loads. They are not earning their keep.

There is much to learn about economic maintenance. Today there are as many ways to do the job as there are men with ability to see the challenge of the problems.

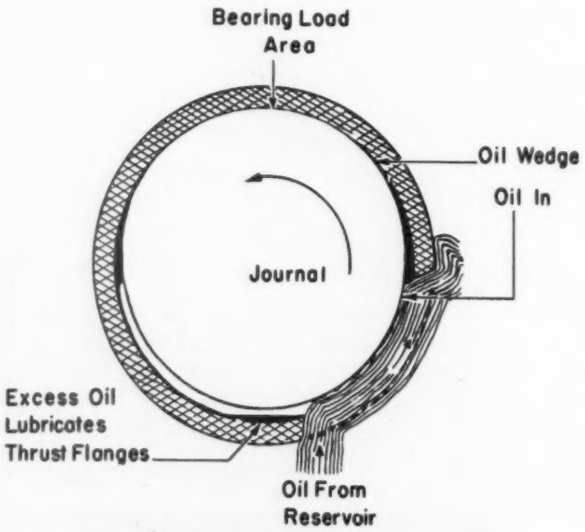


Fig. 1—Diagram of traction motor suspension bearing showing formation of oil wedge

Only as maintenance experience develops can more uniform practices be realized.

The Proving Ground

The diesel-electric locomotive is continually being improved. Its components are far from being standardized as yet. With each new design come features welcomed by the railroads to meet their changing problems. But to the maintenance people these variations of parts and requirements bring despair. Nevertheless, this group holds the key to the development of better motive power. It is the maintenance record that proves the worth of each feature.

As maintainer and designer work together, their efforts will be of great value to the railroads and locomotive builders alike. Maintenance experience brings out the need for changes and improvements. Often, these can be made on locomotives in operation as well as those being designed. Through modification programs existing power can be modernized to give operating benefits at once. Such programs, especially on large railroad systems, need careful coordination of instruction and effort by widely separated maintenance groups. Unless this is carried out in an orderly way, one group may apply a modification which the next group may remove, and some locomotives may be missed completely.

*This is the 2nd of a series of articles on maintenance of diesel-electrical equipment. This article is written by J. W. Teker and J. H. Kathman, both of the Motor Engineering Division, General Electric Company, Erie, Pa.

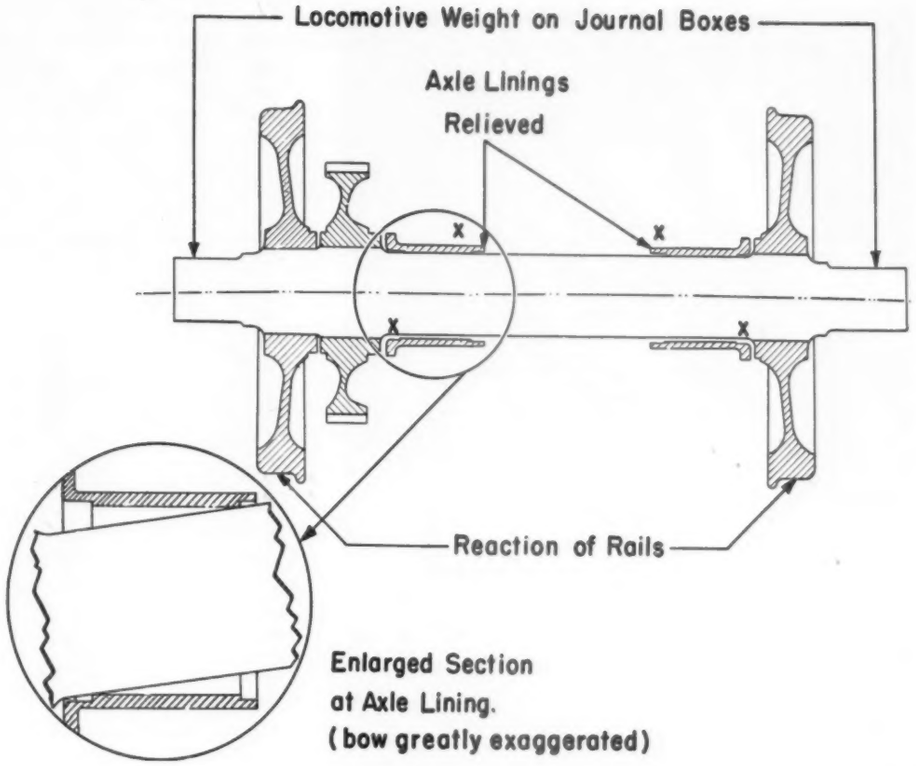


Fig. 2 — Diagrammatic sketch of axle loading showing reason for relief at ends of motor suspension bearings

"How" and "Why" to Help You "Do"

Maintenance recommendations and programs are based on the needs of the equipment. General instructions are issued by the builders to serve as a guide. In practice these are often modified to fit the actual operating conditions found in various types of service. We do not propose to add to these instructions. Rather, we will point out the reasons for them, based on simple descriptions of how the parts operate and what they do. With such knowledge a maintainer can do his job intelligently. Faults can then be located directly without wasting time on "cut-and-try" methods.

Troubles do not happen—they are caused. Therefore, every trouble offers the opportunity to discover its cause. When these causes are known, an understanding of the fundamentals involved makes it possible to set up a program of preventive action.

A maintainer who simply goes through the motion of his job without understanding the reason for what he is doing is very likely to become indifferent and sometimes to take unreasonable short cuts. As a result, he may fail to accomplish his purpose. An example is the case where lubricant intended for the gear case was put into the commutator chamber of the motor instead. The cover was then carefully latched shut, and the man went serenely on to his next job! The diesel-electric locomotive, divided into its separate systems and parts, is simple enough to be clearly understood. When the maintainer understands what these parts do, and how they operate, he feels a new confidence about his job. This enables him to work rapidly and surely, and constantly to improve his effectiveness.

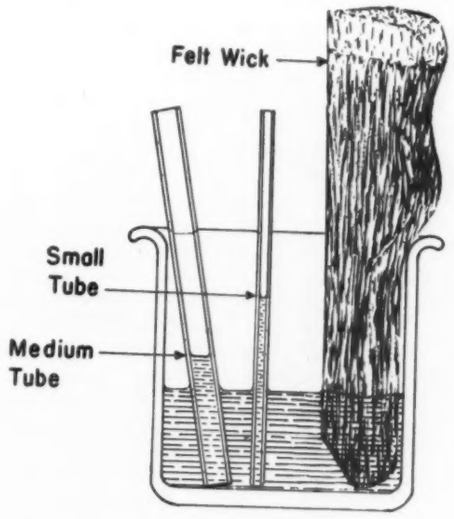


Fig. 3—Comparison of Capillary action

Lubrication

What It Is.—Any picture of the word "maintenance" ought to include an oil can, since lubrication plays an important part in maintaining any apparatus. When we think of lubricating electric machinery on diesel-electric locomotives, we must keep three things in mind:

1. Sleeve bearings.
2. Roller and ball bearings.
3. Gears.

Lubrication of roller and ball bearings and gears will be discussed in a subsequent article.

The job of the lubricant in a sleeve bearing is to keep the journal from rubbing and wearing. With oil lubrica-

Fig. 4—Long-strand wool waste used for "wick" in axle cap bearings

tion, this is done by feeding the oil into an unloaded section of the bearing and developing an oil wedge. Traction motor suspension bearings, such as sketched in Fig. 1, are a common example of this.

How It Works.—As the journal turns in the bearing, it carries the oil into a smaller and smaller wedge space. The pressure on the oil becomes greater and greater until the entire bearing load is carried by the oil wedge. At its thinnest point, this oil wedge is a mere film. This makes the area immediately under the bearing load a devil's workshop when the oil is dirty or the journal is nicked. The trouble and cost of keeping oil clean is a mighty low price to pay for insurance against bearing failures. Periodical cleaning of oil reservoirs and renewing of oil is a big help. On traction motor suspension bearings, for example, this is easily done during wheel changes. The oil reservoirs should be periodically drained to get rid of water and sludge that settles in the bottom. Seals of felt or other material are used to keep dirt and water out of the bearing during operation; these seals should be kept in good condition. They can be readily renewed when necessary, at overhaul inspections or when the equipment is taken apart for other reasons. The old saying, "Cleanliness is next to Godliness" is certainly true of bearings and oil.

Motor Suspension Bearing.—The main place where the sleeve type of bearing is now used in diesel-electric locomotives is in the traction motor suspension bearings. Here it has a multitude of things to do:

1. It must support the weight of the motor on the rotating locomotive axle. This job would not be complicated if the axle were perfectly straight. Actually, it is slightly bowed due to the weight of the locomotive on the journal boxes, as shown in the sketch, Fig. 2.

Because of this, the axle lining is designed with a relief in the ends of the bore. Thus, the ends of the long linings will not cramp on this bowed axle at pressure points marked *X* in Fig. 2. This allows the bearing to seat itself to the axle gradually without the overheating and wiping that would occur at *X* if it were not relieved beforehand.

2. Besides the weight of the motor, the suspension bearings are loaded by gear and pinion forces needed to move or brake the train. These forces are called the gear reaction. They may be three or four times the load on the bearing due to the motor weight.

3. The suspension bearings must also keep the gear and pinion in proper mesh. To do this, they must accurately maintain the distance between the traction motor armature shaft and the locomotive axle.

4. Inadequate lubrication of a suspension bearing has

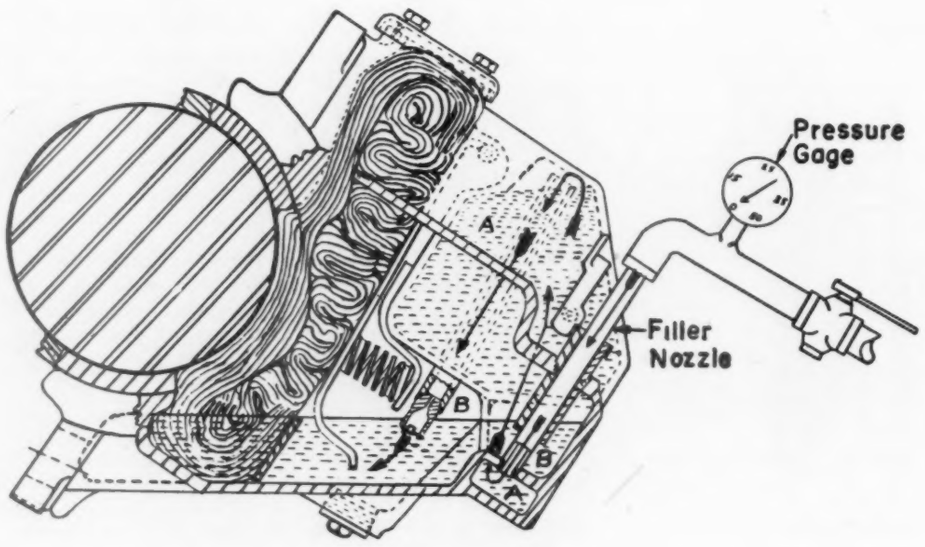


Fig. 5 — Traction motor axle cap showing wool waste packing

Fig. 6—Oil lifting power of loosely and tightly packed waste

many bad results. The thrust flanges of the linings take the worst beating because they are lubricated with only the excess oil from the sleeve portion of the lining. When these flanges wear, the traction motor can shift out of its proper position between wheels and cause interference troubles. This increased end play allows the motor to chuck back and forth between the wheels. The resulting impact blows batter the flanges and running gear.

Wicks and Waste.—It is of the greatest importance to keep these suspension bearings properly lubricated. The main part of this task falls to the wicks which feed the lubricating oil onto the journal. They deserve careful consideration. These wicks are either made up of loose strands of wool waste or formed pieces of wood felt. The waste and the felt, like any other wool material, consist of thousands of thin wool strands, matted together with very small air spaces between them. In the wick, these small air spaces form tubes in which the oil climbs from the reservoir up to the journal. This is called the capillary action of the oil in the tubes. It can be shown by placing a glass straw in a cup of oil. The oil will rise in the straw to a level of about ⅛ in. above the surface of the oil in the cup. If a smaller diameter straw is placed in the same cup, the oil will rise to a higher level (Fig. 3).

The tubes in the wool wick are so small that the oil will rise to a height of four or five inches in them. The oil must be free from sludge and dirt, for these readily plug the capillary tubes in the wick. Since wool is an organic material, the wicks deteriorate with age. The conditions under which the wicks operate will determine how often they must be renewed. Some oils used in axle caps have a high acidity which shortens the life of the wicks. Caustic solution is used in cleaning the bearing caps. If any of this is left in the caps it will attack the wool. Dirty oil will decrease the life of the wicks. All these things exist to some degree in normal operation and, therefore, the wicks must be renewed from time to time to insure good bearing operation.

Replacing Packing.—Replacing felt wick lubricators in traction motor axle caps is easy. These wicks are properly formed in the factory so they fit into place. The springs in the caps apply the correct pressure for good operation. Wool waste packing, however, is a different story. The wool strands used for the wick must be long, continuous, and free from kinks so that the capillary tubes can do their duty. A good example of this type of waste is shown in Fig. 4. Before packing a bearing, all the wool waste should be thoroughly oil soaked.

A backing should be placed firmly behind the wick so that the wick will always be in contact with the journal (see Fig. 5). This backing also serves to squeeze the wool strands of the wick closely together to form capillary tubes small enough to get a good lift. The tighter the wool is packed, the higher the oil will lift. This can be demonstrated by placing several strands of wool loosely in a glass tube. In another tube of the same size pack many strands tightly. Figure 6 shows what will happen.

While it is true that the tighter the pack, the higher the oil rise, it is also true that the tighter the pack, the slower the oil flow. This is because the more the waste is squeezed, the smaller the capillary tubes become. A good waste packing job must be just right;—tight, firm and fully packed.

The wick should also be securely anchored at the top and bottom to prevent waste grab no matter which direction the axle is turning. This can be done by tucking the wick under the backing at the top, and the bottom, as shown in Fig. 5.

Keeping the bearing clean and properly applying the wicks are not the end of the bearing suspension job. This work must be followed up with periodic inspections on radial and lateral clearances to make sure the bearings are within their proper operating limits.

Two General Electric 40-ton electric side-arm pusher locomotives which were placed in service on the Baltimore & Ohio's new Curtis Bay Import Ore Dock at Baltimore, Md., Harbor, when it opened May 15. These units operate on a special narrow-gage track between standard railroad tracks. Power is supplied to each unit's two electric motors by a 250-volt third rail. Pincer-shaped arms, which spring out on both sides of the locomotive and hook onto the freight cars, enable the units to move two lines of freight cars simultaneously when necessary.

CONSULTING DEPARTMENT

Employee Morale

Proper maintenance of diesels requires facilities, material and skilled men interested in the work. How can morale be made an active factor in the diesel shop?

Catch Them Young

Away back in 1929, the Buenos Aires Great Southern in Argentina received its first diesel-electric units and in order to build up a competent maintenance force, the then chief mechanical engineer made a selection from amongst the younger and keener foremen to take care of the supervisory side. He chose as mechanics, electricians, etc., a number of the more outstanding trade apprentices in the locomotive works who were nearing the end of the apprenticeship.

The result was a complete success and, as far as possible, as time went on, other promising apprentices were drafted to the diesel section, care being taken to see that they were given the opportunity to see and to take part in all aspects of the work.

Thus was created a sense of moral superiority which was still evident and paying dividends during the writer's term of office as chief mechanical engineer from 1948 to 1951, by which time the increased influence of labor rules and regulations had done much to destroy the morale in other sections.

The secret seems to be "catch them young, show them everything, and promote by merit".

D. S. PURDOM
Industrial E. Comercial S.A. Sul Americana Tecnica

Diesel-Electric Locomotive Batteries

Questions and Answers

Q.—In giving an emergency charge, how long should it be continued, and how high should the temperature be allowed to rise?

A.—An emergency charge is nothing more than an equalizing charge and this should be continued until the specific gravity ceases to rise after three one-hour readings. During this emergency charge, the temperature should be kept below 115 deg. F.

Filling

Q.—If the acid level is low, will the battery be hotter?

A.—Not necessarily. A low level may be lack of proper maintenance or leaking container.

Q.—If acid level is low, will it affect gravity readings?

A.—Yes. If the electrolyte level is at splash cover, the gravity readings are increased from 15 to 45 points, depending on the type of battery involved. (A low type battery approximately 15 points and a high type battery approximately 45 points.)

Proper flushing is important to battery performance and battery life. It also serves to check battery condition and charging rate

Q.—If acid level is only ¼ to ⅜ in. below high level, is it necessary to add water on daily inspections?

A.—The battery with proper voltage regulator setting should not require more than ⅛ to ⅜ in. of water per month. If water loss of ¼ to ⅜ in. is indicated daily, there is every indication that the voltage regulator is set too high.

Q.—What difference does it make if the water level is higher than standard?

A.—Too high a water level can only result in acid spilling out of the vent caps, causing corrosion to the terminals and connectors of the battery. This naturally results in the dilution of the electrolyte, thereby, decreasing the capacity of the battery.

Q.—How much water should a battery use?

A.—Depending on the type of battery, water consumption should be between ⅛ and ⅜ in. from the top per month.

Q.—Is regular faucet water o.k.?

A.—Regular faucet water is sometimes o.k. However, to be sure send a sample of the available water to any battery manufacturer who will analyze it for you.

Q.—Is water which has been filtered for steam locomotives good for batteries?

A.—Possibly not. It is suggested that this also be tested before use.

Q.—If battery isn't leaking, where did the acid go?

A.—During normal operation of the battery, the water in the electrolyte is broken up into gas particles and is released as such. There is never any loss of acid unless the battery is overflushed.

Q.—Is it o.k. to add acid to low gravity cells?

A.—No. Not unless it is definitely known that the low gravity is due to overflushing or a leaking cell.

Q.—What happens to a cell if it leaks and is run dry?

A.—The plates become sulphated and hard and it is entirely probable that the cell may become shorted internally and ruined completely.

Q.—How long should the electrolyte level be allowed to drop before adding water?

A.—Water level should be checked at least once a month.

Q.—What is the normal evaporation of water?

A.—1/8 to 3/8 in. per month, depending on the size of the battery.

Q.—Does this amount vary between winter and summer?

A.—It is expected that water consumption will be lower in winter than in summer. However, the operation and location of the locomotive will have a definite bearing on this.

Q.—What effect on specific gravity has overflushing?

A.—Overflushing causes loss of electrolyte, reducing capacity of battery, corrosion of battery terminals, corrosion of the battery compartment and lower specific gravity.

Q.—If acid is spilled during shipment, would you recommend adding acid or water?

A.—Acid of the same specific gravity as the balance of the cells should be added to the low cells.

Q.—When acid is lost from overflushing or from sealing leaks, what would you recommend as the proper procedure?

A.—Equalizing charge and acid adjustment.

Q.—How full should we fill the cells?

A.—This depends entirely on the size battery. For high type batteries, like the KMH, the high level is 1/8 in. below bottom of filling tube.

K. A. VAUGHAN
Gould Storage Battery Corporation

Australian Electrification Will Use Pumpless Rectifiers

By Charles Lynch

The Gippsland railway line in the Australian State of Victoria which is to be electrified in 1953, will use 1,500-volt, d.c. power supplied by pumpless, steel tank, mercury-arc rectifiers.

The line is to be electrified from Melbourne to Traralgon, a distance of 97 miles, but it is expected that trains will run from Melbourne to Warragul, a distance of 65 miles, several months before the completion of the whole section.

Electrical energy will be supplied by the State Electricity Commission. There will be 16 traction sub-stations, (6 double-unit and 10 single-unit) where 22-kv., 3-phase, 50-cycle power will be converted to direct current at 1,500 volts. This will be fed to the overhead contact wire system via high-speed circuit breakers.

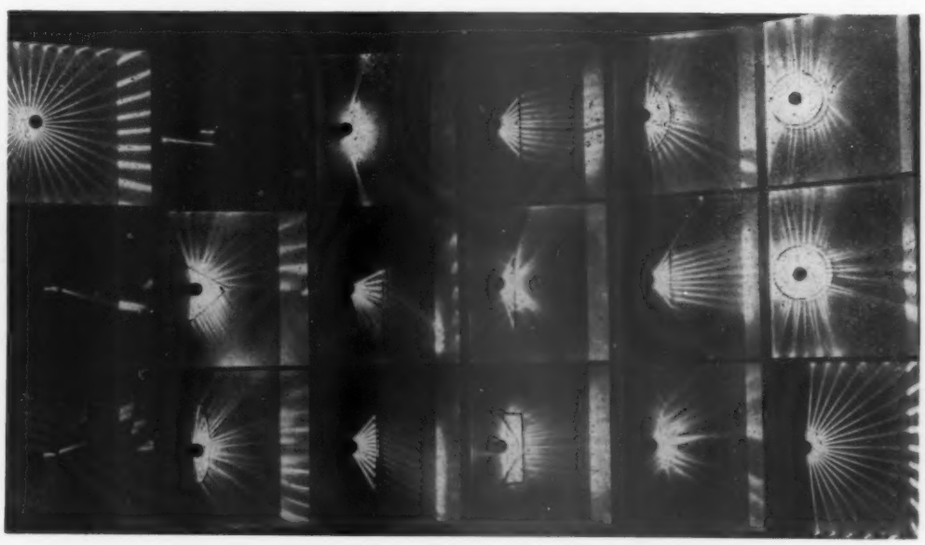
The 1,500-volt overhead contact wire system will be sectionalized at sub-stations, and in some cases at intermediate points between sub-stations where tie-stations will be installed. It is planned to have 12 tie-stations, in which high-speed circuit breakers of the same type as used in the sub-stations will be provided. These circuit breakers operate at sufficiently high speed to clear the overhead circuit they feed, in the event of fault, before any appreciable damage can be done.

All the sub-stations and the stations will be unattended, and the equipment in them will be automatic. The equipment will be under the control and supervision of a power operations engineer located in a central depot which is to be erected at Warragul. Each sub-station and tie-station will be connected to the power operations room by means of two telephone wires through which supervisory equipment will be operated.

In the power operations room, there will be a control desk and control diagram. Small red and green lamps in the diagram will indicate the condition of all rectifiers and circuit breakers to be controlled or supervised. Keys on the control desk will enable the power operations engineer to open or close any of the circuit breakers or rectifiers on the system.

Initially, the power operations engineer will have control of 22 rectifiers, 71 high-speed circuit breakers and 22 high tension feeder oil-circuit breakers.

Telephone facilities will also be provided between the power operations room and all sub-stations and tie-stations.



A Light and Vision Institute was formally opened by Holophane Company, Inc., at its headquarters, 342 Madison Avenue, New York 17, on June 28. It is designed to aid both users and manufacturers of lighting equipment. Included in a large exhibit room is the light control board shown in the illustration, and many other means of demonstrating prismatic control of lighting. Lighted pictures of actual installations border the walls, and beneath these pictures are samples of the lenses and prisms used to produce the effects shown.

EDITORIALS

Mechanical Division Meeting

The A.A.R. Mechanical Division listened to four principal addresses and 18 reports of standing committees during its twenty-fifth annual meeting, held at Chicago June 26 to 28, on subjects ranging all the way from locomotive crank pins to hand brakes, couplers, hot box alarm devices and railway sanitation. A specific effort was made this year to avoid the monotonous and sleep-conducive reading of long committee reports which have already been in the hands of members for several weeks and if briefed drastically in presentation would make that much more time available for pertinent discussion. A definite improvement in this respect was noted but much more needs to be done for a few heads still nod during long reports and, in one instance, an important prepared discussion could not be presented for lack of time.

The Mechanical Division, through its experienced officers and secretary's office, initiated a movement early in 1951 to improve the quality of committee reports and particularly the conduct of annual meetings so as to assure maximum benefits to individual members and the railroads they represent. A circular letter was sent out last January calling for (1) early distribution of committee reports to allow ample time for study in advance of annual meetings, (2) clear and concise presentation of committee reports, (3) instructive discussion of reports, and (4) more people participating in discussions.

Definite progress has been made in advance distribution of the reports, all being available this year from one to four weeks before the annual meeting. To achieve this end, the secretary's office spared no effort in getting reports out to members as soon as received from the printer even though this involved several extra mailings. In view of extra time now required for the purely mechanical job of getting reports through the print shop, it seems obvious that committees have a definite responsibility to start their work earlier in the year and progress it faster if the reports are to be made available sufficiently in advance of the annual meeting.

The situation as to presentation of reports has already been covered with the statement that some reports were briefed this year and more should have been. Discussions this year were for the most part pertinent and instructive, but far less general and argumentative than could be desired. Admitting that most differences of opinion are ironed out in committee meetings before presentation of the reports, there must be some questions of fact or policy which can be discussed with profit in an open meeting of all the members.

There is much which can and probably should be said with respect to wider participation in the active discussion of the reports. This is desired and yet, with chief mechanical officers of individual railroads in such general attendance, is it logical to expect their subordinates, even key staff men, to be very vocal? Especially in the case of subjects which may be controversial, they are more likely to think: "If the boss wants something said about this, let him say it." In reality, if the boss is a real leader, he doesn't want to discourage constructive comment or criticism and probably he admires a man with spunk to say what he thinks.

In view of the need for more pointed and wide-spread discussion if future annual meetings of the Mechanical Division are to achieve maximum usefulness, it would appear desirable to do more than has been in the past to assure a goodly number of prepared discussions, both written and extemporaneous, of the various reports. One way to stimulate voluntary discussions would be for chief mechanical officers to authorize more of their line officers, as well as staff men, to attend and specifically encourage them to participate at will in all discussions of subjects in which they are specialists.

Basic Factors in Reducing Hot Boxes

The factors involved in reducing hot boxes and improving overall freight-car bearing operation are known to be many and varied. Basically, the problem appears to be vulnerable to attack in three principal ways: (1) better observance of existing rules, (2) the development of a cheap but reliable detector for troubles that do occur, (3) a substantial improvement in design, including principle of lubrication and lubricant specifications.

Stricter adherence to rules pretty well speaks for itself. Its role and relative importance in solving the problem has been speculated on for many years, is being speculated on, and undoubtedly will be for many years to come because the effect is not readily measured. The importance of stricter rule observance should not be dismissed lightly, however, because there is much more reason to assume that it would be substantially beneficial than there is to think the effect would be neglible,—particularly in view of open admissions from time to time by high-ranking mechanical officers that their own roads often do not live up to all the rules.

Development of a cheap enough hot-box detector has been attacked on the grounds that it merely indicates trouble when it occurs rather than correcting the basic fault. An effective detector, while having little effect on road delays, would at least prevent the worst troubles, i.e., wrecks. And, even if a perfect bearing assembly were developed, a good detecting system would still be of inestimable value during the period while cars were being changed over.

It would appear to follow that the third alternative—

better design of part or all of the existing bearing assembly—should be pursued simultaneously with the other two. It would also appear that the only thing that is holding back the solution to the general problem is the lack of money with which to tackle the job. There is little doubt that there is sufficient ingenuity among railroad personnel, and there are sufficient facilities available in this country, to solve this problem much faster than it is being solved. Perhaps the money would be more easily forthcoming if each chief mechanical officer would ask his management just two questions—how much is it worth to eliminate hot boxes, and is anywhere near this amount of money being spent to eliminate them.

Electric Motive Power

Reasons for the overwhelming incidence of the diesel-electric locomotive were examined critically by electrical engineers at the Summer General Meeting of the American Institute of Electrical Engineers, held in Toronto, June 25-29. They gave full recognition to the capabilities of the diesel, and agreed quite generally that all railroad motive power of the future would be some type of electric locomotive or car. At the same time, they expressed some wonderment at the almost universal apathy of American railroad men toward the steam locomotive.

In effect, they looked around the world to explore the reasons why some countries use diesel power while others have electrified a large part of their lines and still others adhere to steam. G. Huldschiner, of the College of the City of New York, in presenting a paper on future aspects of electrification, said that one very clear reason for the adoption of the diesel in this country is that oil is abundant and cheap, whereas the countries practicing full electrification in Europe have large resources of cheap water power, not too much coal, and very little oil. He also said that a country with government-owned railroads, even if it is not too prosperous, will find money for its railways. Contrarywise, a private corporation, mighty and powerful as it might be, but suffering from government subsidized competition, and already heavily in debt, faces heavier interest charges and may have difficulty in securing sufficient capital for electrifying a part of its lines.

It became apparent in the discussion that each country had good reason for using the types of motive power it has in service. It is also evident that most of the factors described in the preceding paragraph mitigate against the adoption of more electrification in this country.

On the other hand the subject of electric motive power is very much alive. The diesel is, in fact, an electric locomotive which carries its own power plant. Large quantity production of the diesel has served to improve the quality and reduce the cost of locomotive electrical equipment. The diesel could, if it were desirable, be adapted to operation from an electrical contact system.

In the field of straight electrification, there have been many notable developments in motors and control equipment. The rectifier locomotive recently built represents an innovation which would permit the use of commercial frequencies on the contact system, thereby eliminating the hurdle of wayside conversion.

To aid in the making of surveys, T. M. C. Martin, of the Bonneville Power Administration, produced a method, presented in a paper, which offers a greatly simplified method of making initial surveys to determine the possible economic advantage of electrifying a certain section of a railroad.

The gas-turbine locomotive is beginning to offer some competition to the diesel. It can burn low-grade oil and may be able to use coal. Steam-turbine-electric locomotives, burning coal, have been built and more will be tried.

Should the price of oil increase considerably, relative to that of coal and electric power, railroads would again begin to explore the advantages of straight electrification or other forms of motive power. In such an event, they would approach the subject with vastly improved knowledge and with greatly superior equipment.

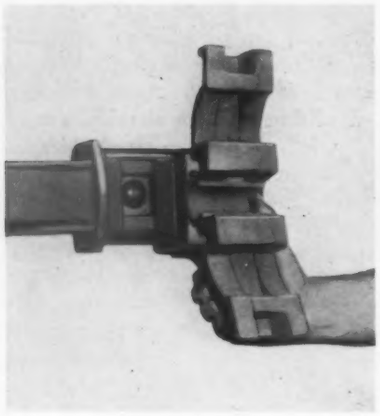
An Opportunity To Discuss Cases

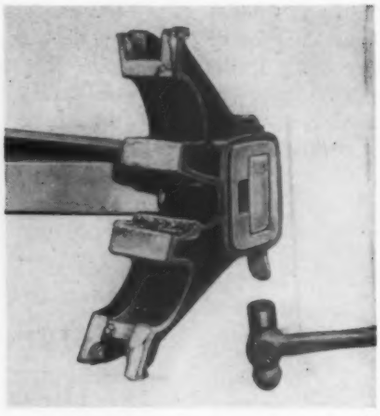
Running through the entire pattern of the Mechanical Division meeting at Chicago there was plenty of evidence that new types of equipment both in the locomotive and car field, coupled with operating practices that have been developed to increase the efficiency of railroad operation, have multiplied maintenance-of-equipment problems. Many of these problems are difficult because in the case of equipment and accessories of compartively recent design and of limited service experience, it sometimes takes years to make the refinements in design from which economical maintenance and trouble-free service result. Only the free interchange of ideas and a broad discussion of the service experience of one road after another can develop data that makes it possible to analyze troubles and apply remedies without undue delay.

Mechanical-department personnel, from officers to supervisors and specialists in the shop and on the road, are particularly fortunate in having a group of associations such as those that meet in September at Chicago which offer the opportunity to bring out the many problems that everyone has to deal with in everyday operation and maintenance work both in the locomotive and car departments. An examination of the programs of the mechanical and electrical groups which appear elsewhere in this issue will immediately impress anyone with the fact that these several associations have done a real job in planning and co-ordinating programs in such a manner as to bring out into the open as many kinds of problems as possible. Fortunately, also, these associations, because of the character of the attending membership, have shown a definite trend toward free discussion of equipment operating and maintenance difficulties as well as a trend toward a minimum use of time for presentation of reports, allowing more time for discussion.

Every mechanical man should look upon these meetings as an opportunity to get his troubles out into the open so that some other member may offer the solution if he has it. It also serves as a real guide to the manufacturer in knowing what troubles railroads have experienced, and to the Mechanical Division, a guide to recommendations for design changes.

NEW DEVICES





Brake Beam with Quick-Removable Heads

With the recent issuance of an A.A.R. Certificate of Approval to the Buffalo Brake Beam Company, New York, covering the new No. 18 freight car brake beam to be known as the Buffalo Truslock, freight car brake rigging will now have all of the operating and maintenance advantages inherent to the quick-removable brake head, standard on passenger cars and locomotive tenders.

The removable sleeve-type brake head has been a significant factor in the present-day high availability of passenger equipment. Barring accidental damage, it is not unusual for passenger car brake beams to remain under the car for considerable periods, even though the brake heads, being the most vulnerable part of the brake rigging, must be frequently changed.

It is claimed that the new Truslock brake beam — the principal feature of which is a novel design of the brake beam ends, permitting the removal of a worn or damaged brake head right at the car by the mere withdrawal of a simple spring-key —will likewise be an important step in the direction of reducing freight car delays due to removing and replacing the entire brake beam when wear or damage requires the application of a new brake head. The new brake beam is of the conventional hanger type of suspension, and is fully interchangeable with A.A.R. former Nos. 3 and 15 and the present No. 18 brake beams.

It is estimated that worn or damaged brake heads account for more than 50 per cent of all freight car brake beam removals. Thus the use of a removable type brake head for freight cars would tend to reduce the volume of brake beams now being sent to reclamation plants by a like amount. In addition, there would be, of course, a corresponding reduction in labor, transportation and handling charges incidental to the movement of brake beams between repair points and reclamation points.

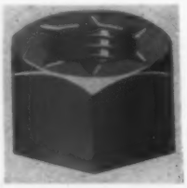
Of interest to mechanical and stores department officers are such features as sleeve and brake heads that are interchangeable on either side of the brake beam, which considerably reduces the inventory on these items; the breathing action of the Truslock brake head reduces operating stresses on the beam itself while considerably lessening wear and tear on the heads; and the truss structure of the new brake beam is completely independent of the brake heads.

The manufacturer states that in addition to the A.A.R. tests upon which Truslock's approval was granted, road tests covering a period of several years were conducted in cooperation with a large Eastern railroad, where a number of the new brake beams were subjected to the severest operating conditions.

The Buffalo Truslock brake beam (A.A.R. No. 64) has been designed primarily as a maintenance brake beam for freight cars equipped with hanger type trucks, and is different from the Buffalo Unit-type brake beam (A.A.R. No. 51).

◆

Gripco Nut for Railroad Use



The Grip Nut Company, Chicago, is now introducing for railroad use the Gripco lock nut which incorporates all principal features including holding power of the No. 3 hot-pressed unit nut heretofore widely distributed and used in railway service. The Gripco nut is the same single unit now available as a semi-finished, thoroughly pretested lock nut in which the holding power is secured by six triangular indentations in the top surface made in the final cold pressing operation.

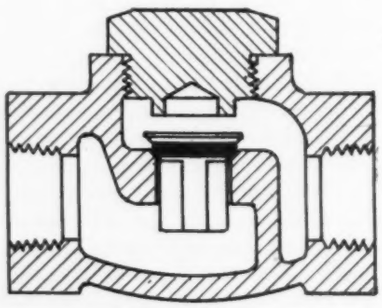
Because of its semi-finished features, the Gripco nut is being offered as a replacement for the No. 3 nut. It is available in hexagon form only with sizes ranging from ¼ in. to 1⅝ in. in either American Standard heavy or regular dimensions. A folder giving complete specifications for ordering the nut has just been prepared.

◆

Two Diesel Locomotive Valves

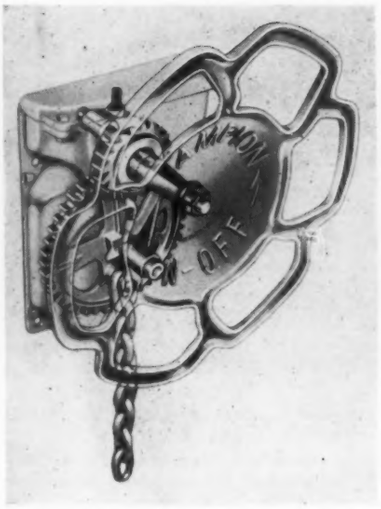
For operating air horns where conditions require the selection of a modulated blast or full blast the Viloco Railway Equipment Company, Chicago has introduced Type 1090 Air Horn Operating Valve which will permit this control by a single lever. At the initial movement of the lever, the center seat is raised, permitting air pressure to pass through a small outlet opening to the air horn, producing a modulated blast. For full blast, added force on the lever raises a large seat, opening the valve to full area.

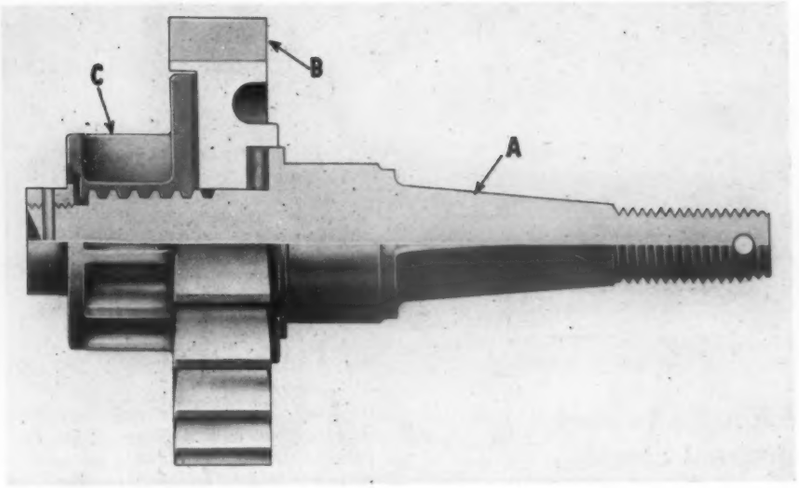
This valve will operate any type of air horn, single or multiple tone, and provides selective control with only one operating



lever. The valve cage can be removed without disturbing the valve body. The Viloco single valve No. 1056 can be converted to modulated control by replacing the internal parts of the 1056 with those of Type 1090.

The second new Viloco device is a check valve for air systems in the ¼, ⅜ and ½ in. sizes, which is claimed to be absolutely bubble tight and to retain air pressure indefinitely in the service of retaining pressure to permit reversing of diesel engines. The "O" ring seat is capable of withstanding a hydraulic pressure test of 2,000 p.s.i., and the valve has been subjected to 140,000 operations under air pressure test without injury to the synthetic rubber ring seat.





Freight Car Hand Brake

The National Brake Company, New York, is offering to the railroads the Champion-Peacock brake which was introduced in its original form in 1937 as the Champion Micro-Matic hand brake. One of the unusual features of this brake is that it may be relased in any degree simply by manipulating the hand wheel.

This brake is operated by simply turning the wheel clockwise to set the brake and counter-clockwise to release it. Any degree of application or release can be made independently of the other and from any point throughout its travel capacity. Basically this method of operation is accomplished by the use of an industrial-hoist type clutch. The clutch consists basically of three parts—a hand wheel, shaft, a ratchet and a pinion, augmented by clutch facings and back-off stops. The latter two are refinements of the basic principle involved.

Referring to the cutaway view: Assuming the brake is to be set or applied, the hand wheel shaft *A* might be considered an ordinary bolt whose head corresponds to the threads on the right end, fitted with a washer *B*, i.e. the ratchet, and a nut *C*, i.e. the pinion. Bolts can, of course, be tightened up by either turning the nut onto the bolt or turning the bolt into the nut. Assuming that the nut *C* is held and tightened up by turning the bolt *A*, thereby squeezing washer *B*, the pressure set up by this squeezing action prevents the brake from turning backward since the washer *B*, actually the ratchet, is held at all times from turning backwards by a pawl (in phantom view).

To release the brake the bolt *A* is turned counter-clockwise which, of course, tends to unloosen the nut *C* thereby releasing the pressure on *B*, permitting it to stand still while the bolt and nut *A* and *C* can be turned counter-clockwise in unison.

Assuming again that the brake has been set or applied, the force created by the brake in the brake rigging is naturally transmitted back to the nut *C*, i.e. in the pinion, in a direction of tightening it on to its bolt *A*, i.e. hand wheel shaft, thereby maintaining the pressure on *B* located between *A* and *C*. The brake will remain in this position indefinitely without loss of power. It will not rattle or jar off, but it can be readily released by simply turning the hand wheel counter-clockwise.

The brake is said to have proved successful from an operating and maintenance standpoint for the following reasons: A switchman can control a freight car equipped with this brake with about the same ease as an automobile can be controlled with foot brake; all operation of this brake requires only the operator's right hand, the left hand being used at all times for holding on to the car; the brake is fully released simply by pulling the wheel counter-clockwise until the load has been released from the chain; even abnormal pressures, such as found when the hand brake has been set up on top of emergency air and the air bled off, can be released by one hand; and it is equipped throughout with self-lubricating Oilite type bushings, each backed up by its own individual lubricant reservoir.

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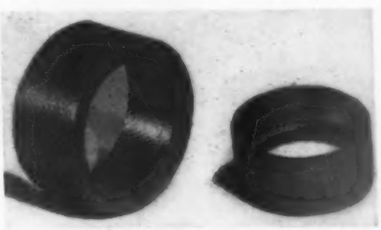


Conduit Joint Gasket

A gasket for vapor steam conduit joints on steam hose has been introduced for railroad service applications by Pilot Packing Company, Sea Cliff, N. Y.

This gasket is manufactured from asbestos fabrics combined with high heat resistant compounds molded with close tolerances to conform with contour of the nose piece and gasket cavity of the joint.

The manufacturer states that under high-pressure steam heat and steam jet air conditioning, tests indicate longer life because the gasket will not vulcanize into the cavity, thus maintaining joint in better condition and reducing overhauling costs. Steam generation costs are thereby reduced by less steam loss through leakage.

Identified as style No. 1315, these gaskets are available in 2 and 2½ in. sizes.

◆

Silastic Tape Insulation

According to its manfacturer, easy-to-apply Silastic Tape, Type R, vulcanizes to form a continuous void-free jacket that is moisture proof, stable and resilient at top Class H operating temperatures (180 deg. C.), as well as highly resistant to oil and to both mechanical and electrical fatigue. Over 4,200 main and interpole field coils insulated with Silastic Tape, Type R, are in service on diesel-electric traction motors.

Many of these coils have been in service for more than 15 months with no failures reported even in the case of one locomotive that was suddenly thrown into reverse by a short circuited control panel. The cost is comparable to Class B coils; life expectancy is in the range of 10 to 1.

Silastic tape is manufactured by Dow Corning Corporation, Midland, Mich.

Lipp rust-proof journal sleeve before application. Center: The sleeve is pressed firmly over the journal and dust-guard seat. Right: Taping the sleeve holds it securely in place. A slight tug will remove the sleeve.

Lipp Rust-Proof Journal Sleeve

A rust-proof journal sleeve, recently developed by the J. J. Lipp Paper Company, Chicago, consists of a heavy, creped, waterproof and reinforced material, laminated on one side with VPI (vapor phase inhibitor) and fabricated in sleeves to fit over and protect machined axle journals. The action of the VPI chemical rust inhibitor is described as formation of a vapor, the molecules of which adhere to metal surfaces within the container, chemically attack oxygen and hydrogen in the confined space and make these gases inert as far as corrosion is concerned.

VPI is patented by the Shell Development Company, and paper impregnated with this material is made under licence by the Angier Corporation for general industrial packaging. Thorough tests indicate that this new rust preventative may revolutionize ordinance packaging and it is already being widely and successfully used on high-finished diesel engine parts during shipment to railroads where these parts are said to arrive in excellent condition and ready for immediate use without cleaning.

The Lip rust-proof journal shield also has shown favorable results in tests by the Griffin Wheel Company, a leading car builder and about 20 railroads to date. The sleeve is received as a heavy flat envelope with the VPI impregnated paper on the inside.

In applying the sleeve, the closed end is pushed in forming the sleeve into a round tube. It is then placed over the journal and dust guard seat and held there with the knee while a strip of Lipp's waterproof pressure-sensitive tape is applied, half on the axle shoulder and half on the sleeve, and wrapped completely around the axle. This holds the sleeve on the axle and keeps water out. The ends are then folded back and taped down to form a neat tubular cover. In removing, a slight tug on the tape is all that is required to release the sleeve.

In practice, newly-turned journals will be protected at the lathe, and moved into storage with the sleeves attached. When the wheel assembly is ready for installation in a truck, it is rolled to the truck and the sleeves removed, requiring only a few seconds. These sleeves are then placed on the bad-order journals to furnish protection until the wheel and axle assemblies are returned to the wheel shop.

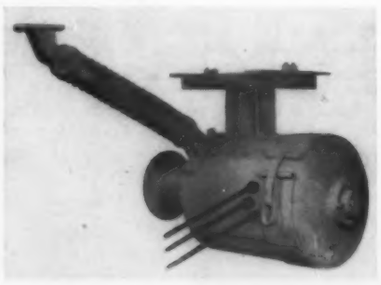
It is expected on the basis of test observations of VPI material that the Lipp shield will protect journals in out-door storage up to two years. In addition to other advantages, use of the sleeve will avoid the necessity of periodic repainting the journals of stored axles and wheel assemblies. The sleeve is presently being made in three sizes, 5 in. by 9 in. 5½ in. by 10 in. and 6 in. by 11 in. If desired it can be supplied in extra lengths to extend over and protect finished wheel seats as well as the journals.

Caboose Power Supply

A lightweight and easily maintained generator which is said to meet requirements for radio power supply equipment for caboose installations has been developed. For use with a nominal 12-volt storage battery, the unit, made by the Safety Car Heating & Lighting Co., New Haven, Conn., is rated 1,000 watts, 15 volts; and for a nominal 6-volt battery, the rating is 850 watts, 7½ volts. It has a full load speed of 500 r.p.m., and a cut-in speed of approximately 375 r.p.m.

Suspension is of the universal type and arranged so that the armature pulley can be placed on the center line of the car. It can be applied to existing cars with only minor changes in the underframe. Alinement of generator with car axle is said to be easily accomplished and suspension provides constant belt tension.

The generator regulator is a modification of standard models and method of adjustment and type of control are indentical with those of the standard car lighting generator regulator. It is mounted on a steel panel. The reverse current relay is mounted on the regulator panel.



The regulator can be supplied with a standard black enamel cover, by the use of which the car electrical locker can, it is stated, be dispensed with, saving considerable installation cost.

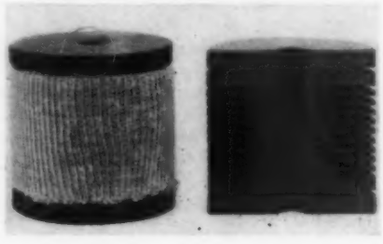
◆

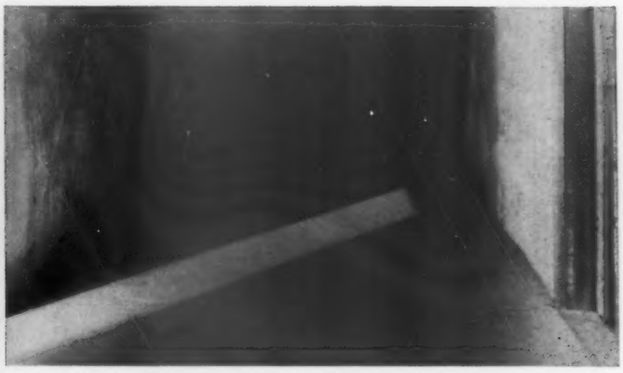
Cellulose Oil Filter

An oil filter, using molded cellulose fibers as the cleansing medium, has been developed by the Briggs Filtration Company, Washington, D.C. Complete filters and replacement cartridges are available for standard makes of automobile, truck and heavy stationary and mobile equipment.

A bonding agent is applied to natural cellulose materials which are formed, under pressure, into cartridges of blocks. The size of fibers controls the porosity of the block. These blocks are then stabilized by a series of thermal processes which fix the finished dimensions. Cartridge blocks are rendered impervious to water and therefore retain their original dimensions in use.

Reports from users indicate, according to the manufacturer, that this medium has an exceptionally high dirt retention capacity, and that there is no "unloading" action between filtration cycles. The overall efficiency and long life of the filter are therefore desc ibed as exceptional.





Flooring for Box Cars

A recently developed nailable flooring, made of oxychloride cement and called Plastinail, is now being used as a method of renovating worn box car floors. A feature of the flooring is that blocking nails may be applied in any location and readily withdrawn with little or no chipping of the material. The following advantages are claimed for this new flooring material: It does not require any change in floor design; is easily applied and can be placed in service 48 hours after setting; is flexible and light in weight; will not splinter; increases floor compressive and transverse strength in some instances over 100 per cent; is permanently smooth, minimizing damage to lading; prevents leakage of bulk materials; is fire and spark proof; is resistant to oils and greases and easy to clean; is not affected by heat or cold; and promotes long floor life with minimum out-of-service time.

The installation of Plastinail flooring is accomplished by first covering the old floor of the box car with 15-lb. asphalt-saturated felt paper. This provides a separation for independent expansion between the old wood and the new Plastinail floor. No. 16 gage, 2-in. sq. mesh reinforcing wire mesh is then nailed over the paper. Retaining strips are fastened in the doorways of the car. A wet mix of Plastinail is prepared and troweled into the wire mesh to a thickness of 1 in. and then smoothed level. Additional trowelings are given the floor to obtain the desired smoothness. Plastinail may also be applied in the same manner, ⅜ in. thick, to the insides and ends of box cars to reinforce the interiors and give a smooth surface for handling bulk shipments without danger of damage or possible infestation.

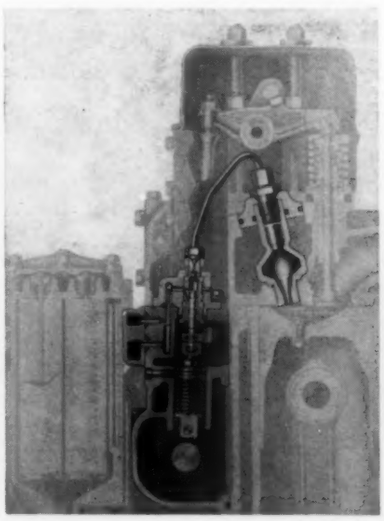
The first Plastinail floors were applied in June 1947, and test cars are reported to be giving good service on 27 railroads, including one which has 62 box cars equipped. Experience indicates that the only damage normally encountered with these floors consists of nail holes and other small holes which may be easily repaired by applying a mixture of the original material with a trowel at minor cost.

Plastinail is a joint development of the F. E. Schundler Company, Joliet, Ill.; the Westvaco Chemical Division, Food and Machinery Chemical Corporation, Newark, Cal.; the Dow Chemical Company, Midland, Mich.; and the Weyerhaeuser Timber Company, Minneapolis, Minn. Plastinail is distributed by Schundler east of the Rockies and by Westvaco on the West Coast.

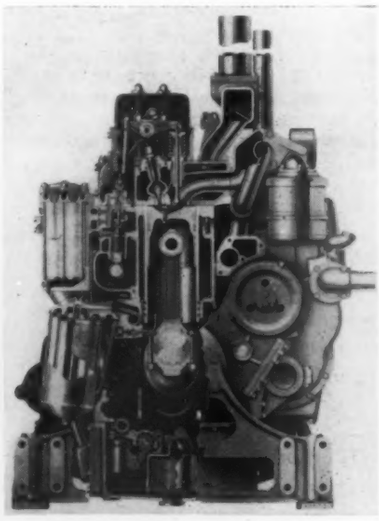
Diesel Engines with New Piston Cooling System

Two new Caterpillar industrial diesel engines, the D337 and D326, are scheduled for production soon, by the Caterpillar Tractor Co., Peoria, Ill. The six-cylinder D337 engine is an industrial version of the 5⅛ in. by 6 in. engine developed for tractors, while the D326, similar in design, has a lower horsepower range.

One feature of the two models is the practice of mounting fuel pumps adjacent to the cylinders they serve. This results in standard, identical, short fuel lines for each cylinder.



Cutaway view



Cross section

Oil-cooled pistons on both models have an iron band cast integrally for the upper ring, and are cooled by an oil stream sprayed from a nozzle solidly attached to the engine block. Since this spray lubricates the piston pin, as well as cooling the piston, oil grooves are not required in the connecting rod.

Fine filtration elements which handle the full flow of oil to the engine system are incorporated in both engines. Oil passageways are protected from dirt and foreign material falling into them while filter elements are being changed, and sludge collects where it cannot enter the oil passageways or relief valves.

Horsepower ratings for the new engines (without fans) are for the D337 and the D326, respectively, 275 and 186 peak; 250 and 171 intermittent; 180 and 125 rated; and 170 and 118 hp. continuous.

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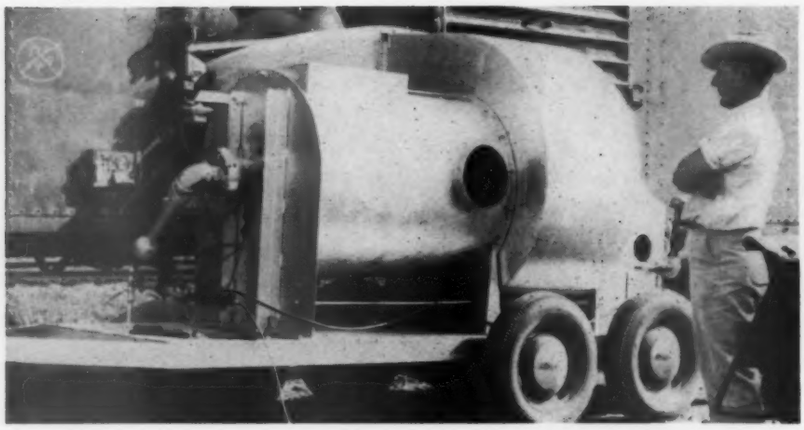
Portable Dryer and Heater

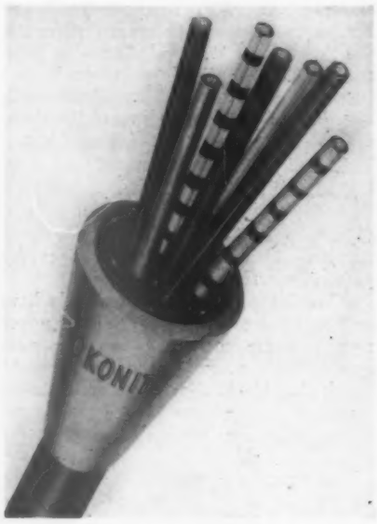
For such diverse applications as thawing, preheating, and drying of agricultural, industrial and other products carried in rail-



road cars, the Southwest Industrial Heating Engineers, Dallas, Tex., has introduced the Farm-Mor Portable Dryer and Heater. Other uses of the unit include supplying a source of heat for emergency crews working in subfreezing weather and under other difficult conditions.

These units are manufactured in three sizes, either trailer- or skid-mounted, and come with complete temperature controls and 100 per cent safety devices to shut off all fuel in event of mechanical or flame failure.

Standard models deliver heated air at temperatures up to 200 deg. F. and in capacities up to 23,000 cu. ft. per min. available.



Waterproof End Seal

A moisture seal for terminating multiconductor sheathed cables is offered by the Okonite Company, Passaic, N. J. Cone-shaped to receive filling compound, this device is easily slipped over the cable and eliminates friction tape or makeshift windings.

Applicable to cable diameters from ¾ to 2 in., the Okonite End Seal snugly fits over the cable sheath, preventing compound leakage. The compound hardens to form a neat, permanent, moisture-proof seal and keeps conductors properly spaced.

This seal is said to be mechanically strong and to afford long-time resistance to sunlight, air, ozone, oils and chemicals.

Battery-Less Car Lighting System

A method of operating car lighting systems offered by the Waukesha Motor Company, Waukesha, Wis., eliminates the conventional 400-1,000 ampere-hour car lighting battery. The method employs only an ordinary automotive-type battery—five 6-volt units in series on a 32-volt system, or five 12-volt units on a 64-volt system—to start the Enginator (Waukesha trade name for an engine-generator system) and activate the controls.

The battery-less d.c. Enginator was inspired by the reliable and satisfactory operation of a.c. Enginators, which, because no car lighting battery can float on the a.c. lines, must supply the complete electric requirements for each car by operating continuously.

Attracted by the possibility of saving several thousand dollars per car in capital investment and annual maintenance charges by substituting the small automotive type battery for the large car lighting battery and, in addition, saving the under-car space and dead weight of the larger battery, one major railroad has given the Waukesha B-L (battery-less) system a six-month winter's trial this past year, on a daily run between Chicago and Denver. As a result of this experience 20 more cars of this road will be changed over to the Waukesha B-L system this year.

The equipment employs the Standard Waukesha 7½-kw. d.c. propane Enginator either 32-volt or 64-volt, or the 25-kw. d.c. diesel Enginator, also 32- or 64-volt, a simple automatic battery charging panel to maintain the small starting and control circuit batteries, and another control panel for continuous Enginator operation.

The Waukesha B-L system with controls is being offered for either new car installation or for converting existing installations.

◆

700 Watt Dynamotor

Electrical isolation of the braking circuit from the main power line is provided through a new 700-watt dynamotor recently introduced by the Safety Car Heating & Lighting Co., New Haven, Conn. With this device, the braking circuit is independent of any grounds which may occur on the primary source.

Output voltage of the device is increased approximately 2 volts above any input value. At the lower values of voltage encountered on diesel power operation, the slightly higher voltage in the braking circuit is said to insure better and safer magnet valve operation.

◆

Three Diesel Products

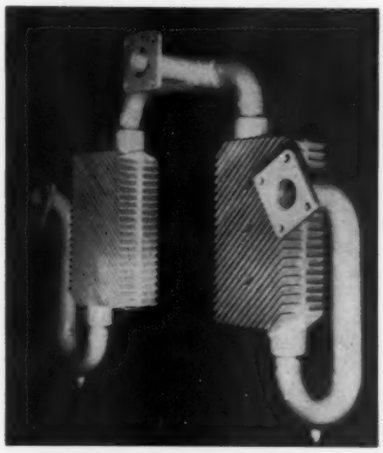
Three products recently brought out for application to diesel locomotives by the Wilson Engineering Corporation, Chicago

3, include a final radiation cooling system, intercooling assemblies for Gardner-Denver and Westinghouse air compressors, and a fuel oil heater which uses by-passed engine coolant without any waste of heat.

The final radiation cooling system is made of aluminum, has a weight of 65 lb., and occupies a space 34½ in. by 5 in. by 8⅜ in. The heat transfer of a single element in static atmospheric air is equivalent to 30 ft. of 1½-in. standard pipe. Two elements mounted in parallel are equivalent to 80 ft. of the 1½-in. pipe.

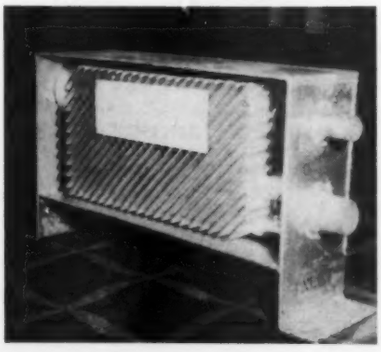
The intercooling assembly is adaptable to both Gardner-Denver WXE and WXO air compressors, and to Westinghouse types 3-CD and 3-CDB. The assembly has a radiation equivalent of 40 ft. of 1½-in. pipe, weighs 120 lb., and is factory tested to 300 p.s.i.

The fuel oil heater occupies a space 24 in. by 12¾ in. by 6⅜ in. It maintains the desired fuel oil temperature by a regulating valve which controls the flow of the by-passed jacket water.



Intercooling assembly

Aluminum radiation element



Fuel oil heater

Flexible Metal Tubing

A handy hookup for car heating applications has been introduced by the American Brass Company, American Metal Hose Branch, Waterbury, Conn., employing flexible metal tubing complete with fittings.

The product is described as easy to connect and disconnect as it replaces heavy, cumbersome, leaky swing joints which require packing and frequent maintenance. The tubing can be used to convey steam from 125 to 150 lb. per sq. in. pressure from heating connections to railroad cars lying over for temporary stay, loading or changing locomotives.

Ease of connection and non-corrosive properties of the casing afford protection against abrasion, adding to strength and long life. The whole assembly is said to be constructed to withstand inclement weather, light-weight, extremely flexible, and leak-proof throughout to provide against loss of steam.

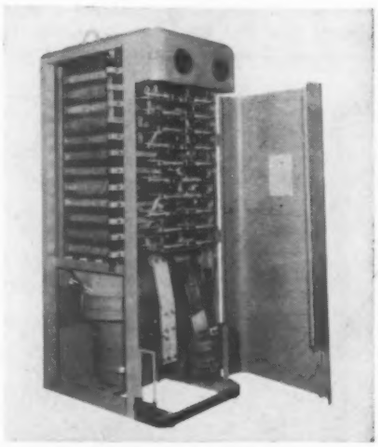
Loading Resistors for Diesel-Electric Locomotive

A new portable loading resistor (Type 17EM55D2) for load testing diesel-electric locomotives up to 2,500 hp., has been announced by the General Electric Company's Locomotive and Car Equipment Divisions, at Erie, Pa. The resistor is rated at 3,450 amp. continuous, and 4,000 amp. for 15 minutes.

The unit was designed for run-in tests, running-in new bearings and similar parts, setting generator current limit, and setting diesel horsepower obtained over the constant horsepower portion of the generator characteristics. The new resistor is a completely self-contained unit, requiring no external mechanical, liquid, or electrical connections except the power cables connecting the locomotive and the resistor. Resistor loading is constant, not varying from cold to hot. Mounted, the loading resistor is easily moved by a battery truck, and can be used indoors or outdoors.

The resistor assembly consists of 12-air-cooled resistors. Elements are aluminum-chromium-iron resistance alloy in parallel strips providing maximum surface area for cooling. Designed to operate at maximum temperature of 350 deg. C., the elements are supported in frame slots to permit expansion of elements under load. The resistor frame is made of asbestos-lumber insulation with strip-steel supports to withstand high temperatures.

A blower unit is mounted vertically, commutator end down, under the loading



resistors. An air diffuser, between fan and resistors distributes air from screened intakes at the base over the resistor assembly to dissipate heat generated by the electrical load. Blower speed automatically increases with resistor load. So the resistor will not operate without the blower, power from the resistor operates the blower.

Testing points are obtained by a combination of switches on a panel inside the resistor door. Knife switches are easily set to the testing point desired, and the door is closed to provide a dead front.

Two high-accuracy, long-scale, switchboard-type instruments are permanently mounted on the case above the access door. Output is indicated in volt and ampere ratings, and is easily converted to horse-

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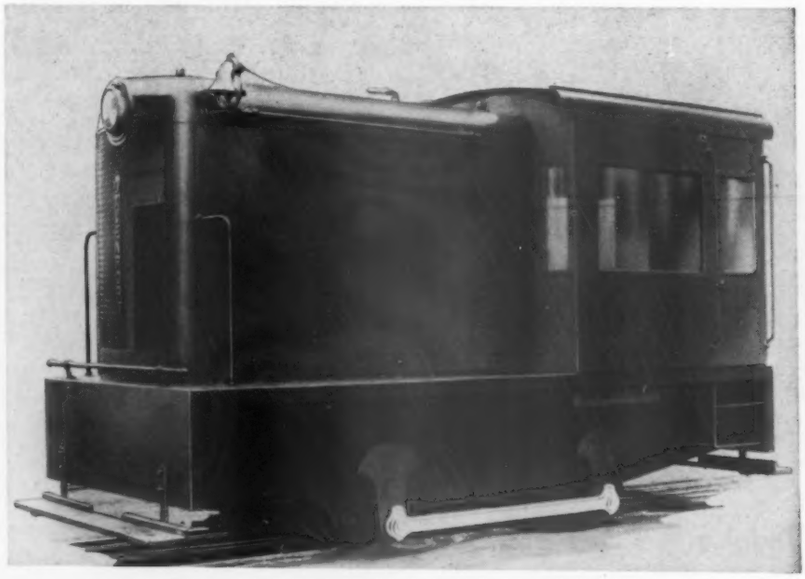

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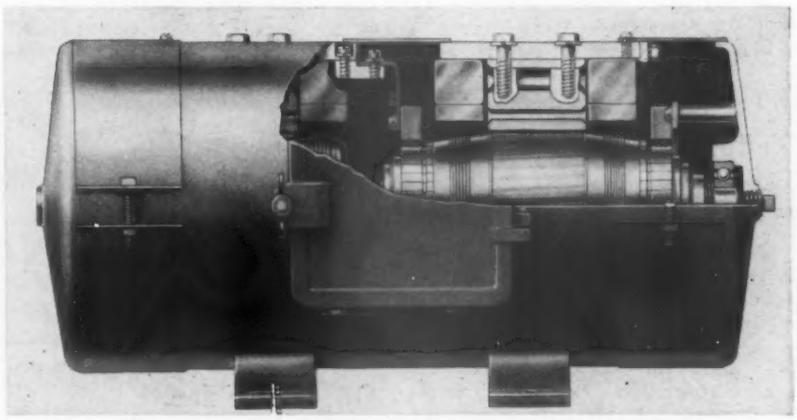

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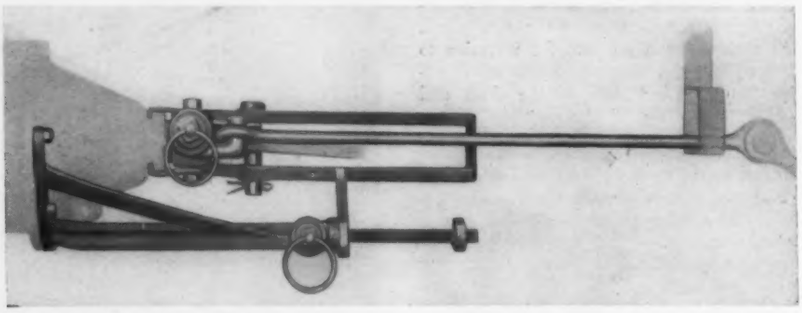

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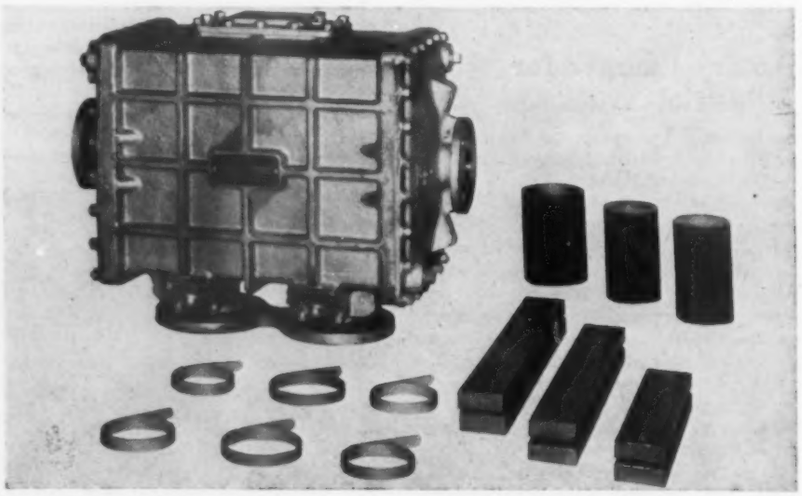

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The cooler has been designed to replace the present air-cooled engine cooling system. It is furnished to supply better year-

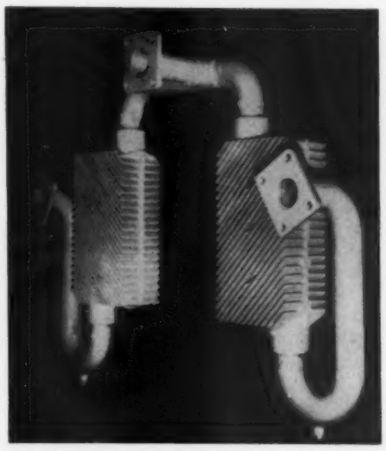
(Continued on page 102)

3, include a final radiation cooling system, intercooling assemblies for Gardner-Denver and Westinghouse air compressors, and a fuel oil heater which uses by-passed engine coolant without any waste of heat.

The final radiation cooling system is made of aluminum, has a weight of 65 lb., and occupies a space 34½ in. by 5 in. by 8⅜ in. The heat transfer of a single element in static atmospheric air is equivalent to 30 ft. of 1½-in. standard pipe. Two elements mounted in parallel are equivalent to 80 ft. of the 1½-in. pipe.

The intercooling assembly is adaptable to both Gardner-Denver WXE and WXO air compressors, and to Westinghouse types 3-CD and 3-CDB. The assembly has a radiation equivalent of 40 ft. of 1½-in. pipe, weighs 120 lb., and is factory tested to 300 p.s.i.

The fuel oil heater occupies a space 24 in. by 12¾ in. by 6⅜ in. It maintains the desired fuel oil temperature by a regulating valve which controls the flow of the by-passed jacket water.



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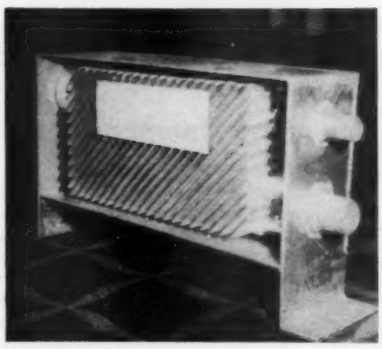

Fuel oil heater

Flexible Metal Tubing

A handy hookup for car heating applications has been introduced by the American Brass Company, American Metal Hose Branch, Waterbury, Conn., employing flexible metal tubing complete with fittings.

The product is described as easy to connect and disconnect as it replaces heavy, cumbersome, leaky swing joints which require packing and frequent maintenance. The tubing can be used to convey steam from 125 to 150 lb. per sq. in. pressure from heating connections to railroad cars lying over for temporary stay, loading or changing locomotives.

Ease of connection and non-corrosive properties of the casing afford protection against abrasion, adding to strength and long life. The whole assembly is said to be constructed to withstand inclement weather, light-weight, extremely flexible, and leak-proof throughout to provide against loss of steam.

Loading Resistors for Diesel-Electric Locomotive

A new portable loading resistor (Type 17EM55D2) for load testing diesel-electric locomotives up to 2,500 hp., has been announced by the General Electric Company's Locomotive and Car Equipment Divisions, at Erie, Pa. The resistor is rated at 3,450 amp. continuous, and 4,000 amp. for 15 minutes.

The unit was designed for run-in tests, running-in new bearings and similar parts, setting generator current limit, and setting diesel horsepower obtained over the constant horsepower portion of the generator characteristics. The new resistor is a completely self-contained unit, requiring no external mechanical, liquid, or electrical connections except the power cables connecting the locomotive and the resistor. Resistor loading is constant, not varying from cold to hot. Mounted, the loading resistor is easily moved by a battery truck, and can be used indoors or outdoors.

The resistor assembly consists of 12-air-cooled resistors. Elements are aluminum-chromium-iron resistance alloy in parallel strips providing maximum surface area for cooling. Designed to operate at maximum temperature of 350 deg. C., the elements are supported in frame slots to permit expansion of elements under load. The resistor frame is made of asbestos-lumber insulation with strip-steel supports to withstand high temperatures.

A blower unit is mounted vertically, commutator end down, under the loading

resistors. An air diffuser, between fan and resistors distributes air from screened intakes at the base over the resistor assembly to dissipate heat generated by the electrical load. Blower speed automatically increases with resistor load. So the resistor will not operate without the blower, power from the resistor operates the blower.

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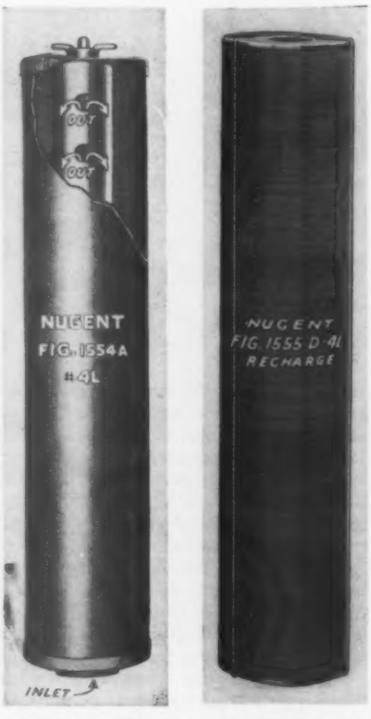

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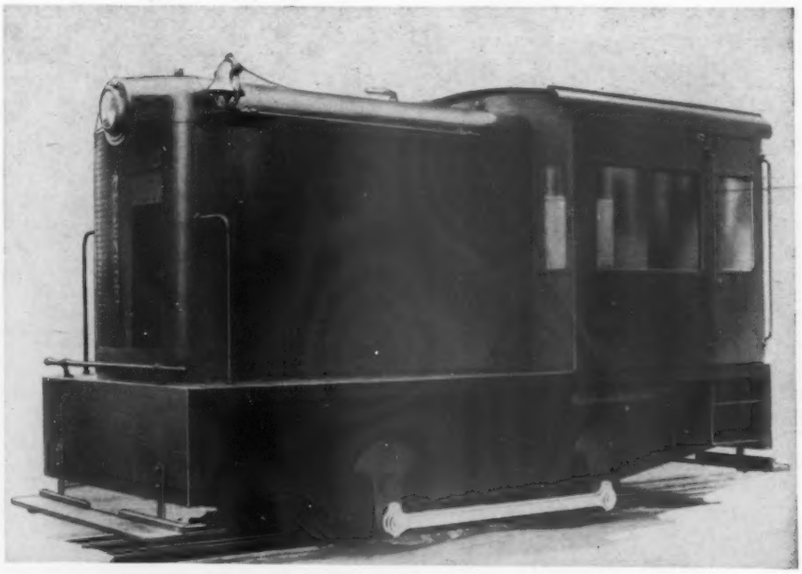

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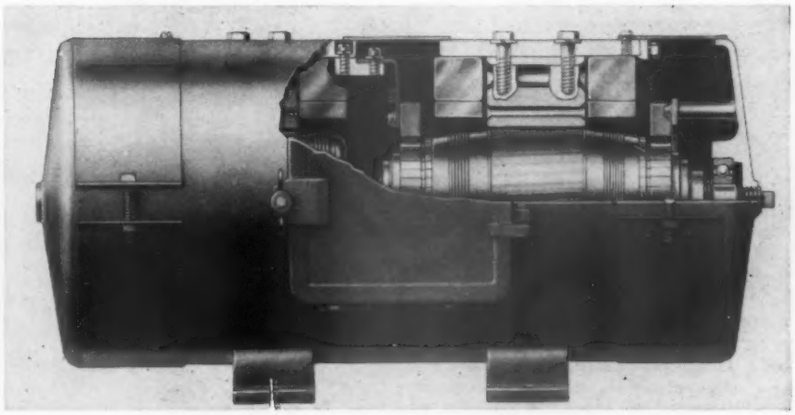

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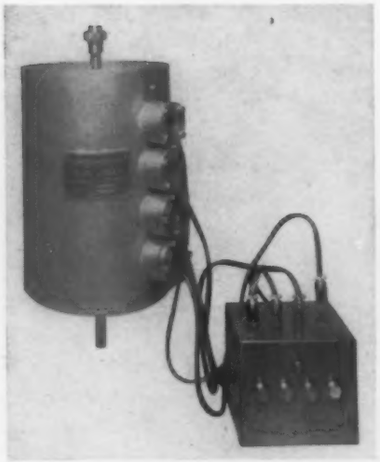

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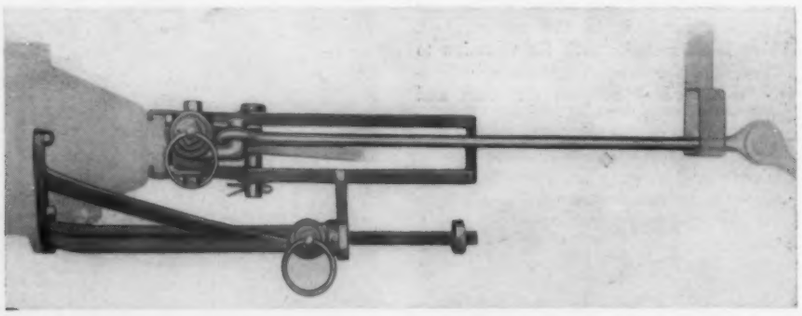

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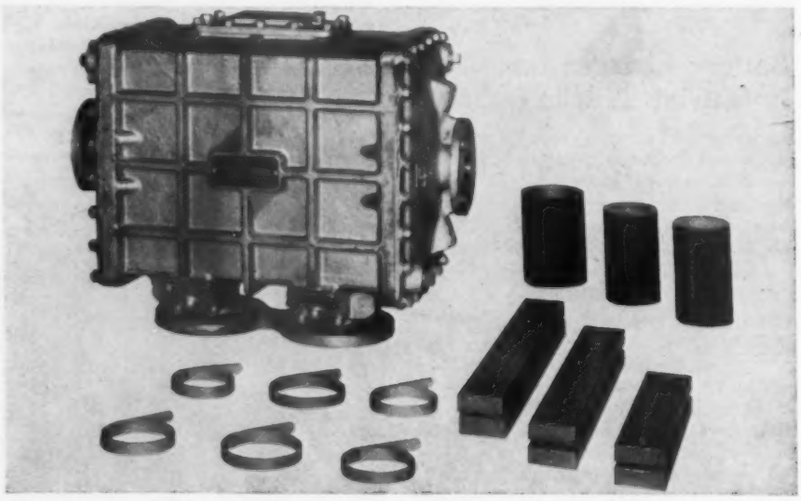

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American Railroads are really working now... for defense, for all of us... moving over 20,000 ton-miles per hour of train operation—shooting for a 700 *billion* ton-mile total in 1951.

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YOU can reduce your railroad's investment in Diesel locomotive parts inventory by using Electro-Motive's "Unit Exchange" service.

Factory-rebuilt assemblies—traction motors, generators, blowers and other components—are available for shipment on schedule from Electro-Motive's six Factory Branches. All have been expertly rebuilt and are fully guaranteed.

Low Flat-Rate Charge

You pay no premium for "Unit Exchange" service. When we rebuild your unit, the cost is the *same* whether we send back the same unit (Rebuild and Return) or furnish immediately a unit from our pool (Unit Exchange). You pay only the cost of bringing the complete assembly to top standard condition—at Electro-Motive's low flat-rate charge.

"New Part" Guarantee

Every assembly rebuilt by Electro-Motive carries the same guarantee as a brand-new part—*100,000 miles or one year of service*. And this guarantee dates from time of application on locomotive, *not* the date of shipment.

Write us or ask your Electro-Motive representative for full details.

Let's keep 'em turning!

Through "Unit Exchange," Electro-Motive actually carries the spares for you. There is no extra charge for this service, but we urge your cooperation in returning exchange units promptly. This will keep "in transit" float to a minimum and expedite shipment of "rebuilds." It will help assure getting rebuilt units when you need them.

ELECTRO-MOTIVE DIVISION

GENERAL MOTORS • LA GRANGE, ILLINOIS

Home of the Diesel Locomotive

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43
43
43

(*Continued from page 98*)

round temperature control, reduce maintenance costs, save on lube-oil life and bring faster warm-up time.

Easy to install, the cooler system can be mounted on the floor of the air chamber in front of the engine's water radiator. A simple piping arrangement connects the new oil cooler into the engine's cooling system. The new cooler does not require moving parts. A changeover can be quickly made by following installation drawing.

◆

Automatic Illumination Control

A simple weatherproof illumination control of the plug-in type is announced by the Weston Electrical Instrument Corporation, Newark, N. J. Known as the Model 1089, the unit provides completely automatic "on-off" control of artificial lighting at predetermined levels of daylight, thereby eliminating human judgment and arbitrary time schedules. It is recommended for yard lighting, station area lighting, sign lighting, etc.

The unit, mounted in a standard weatherproof watt-hour meter glass case, consists of a stable dry-disc type photocell, a sensitive relay which is operated directly by the photocell, a clock motor, mercury switch and limit switch. It contains no phototubes, vacuum tubes or capacitors, and requires

no stand-by power, drawing no current between on and off operations.

Installing the Model 1089 requires only plugging it into a standard watt-hour meter receptacle. It will withstand adverse climatic conditions and will function at temperatures as high as 140 deg. F and down to —30 deg. F.

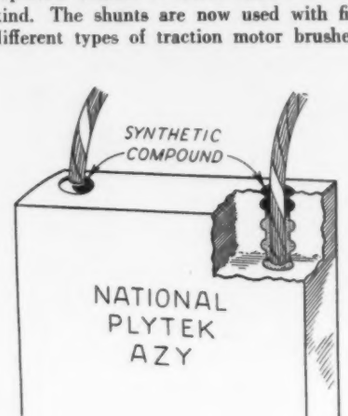
◆

Tamped Shunt For Motor Brushes

A tamped shunt connection for diesel-electric traction motor brushes is the latest carbon brush development of National Carbon Company, a Division of Union Carbide and Carbon Corporation.

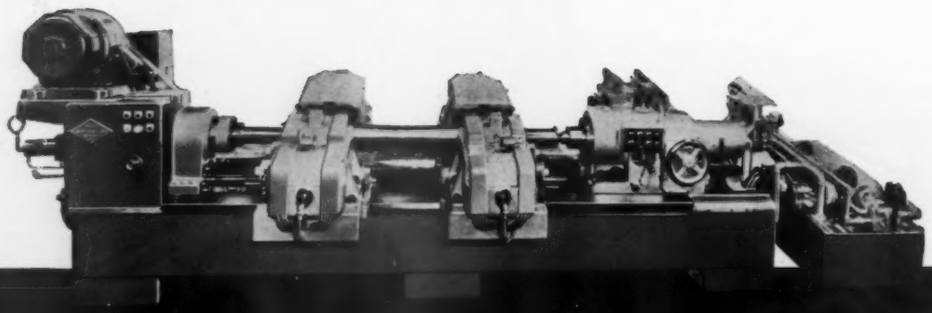
The shunt, which in itself is sealed, utilizes a synthetic compound that further seals and strengthens the connection. The manufacturer states that the shunt will not pull out, and that it prevents a concentration of static and dynamic stresses, thereby virtually eliminating cable fraying.

Brushes equipped with this newly developed shunt were subjected to severe laboratory tests run under accelerated conditions to destruction of the connection and the results were then substantiated in extensive and lengthy field service. Double the life of the previous connection is reported without a shunt failure of any kind. The shunts are now used with five different types of traction motor brushes.



• • •

Locomotive cabs for General Motors freight, passenger, switching and general purpose diesel locomotives are put together on the conveyor assembly line principle at Electro-Motive Division's plant at Chicago

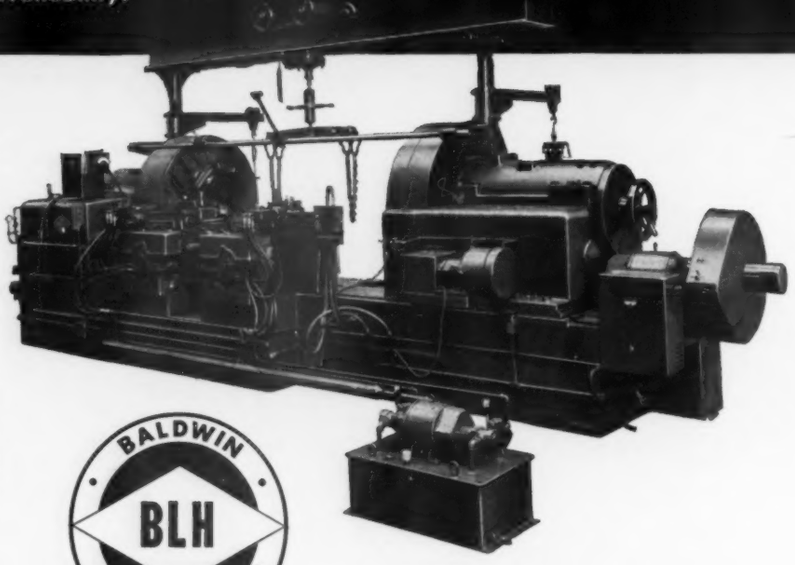


NILES Axle Burnishing Lathe. Independently or simultaneously burnishes journals and fillets of new or refinished axles. Users report 50% higher production than on conventional machines.

a BIGGER JOB AHEAD means a BIGGER JOB AHEAD

Be ready with these NILES

Getting bad-order cars and shopped locomotives back in service *quicker* produces the same result as buying new rolling stock—and it's a whole lot cheaper! Just check the records on these modern Niles railroad shop tools . . . you'll see how they are paying off for users in increased rolling stock availability.



NILES Car Wheel Lathe. One shop says, "Wheel re-turning time halved by this new machine." Designed to take pressure of carbide-tipped tools. Roughing cut is finish cut. Profiling attachment permits further saving in time per set.

A representative will be glad to tell you how Niles railroad shop tools can help you keep your shop production ahead of today's expanding needs. Write, wire or phone.

LIMA-HAMILTON DIVISION
Hamilton, Ohio

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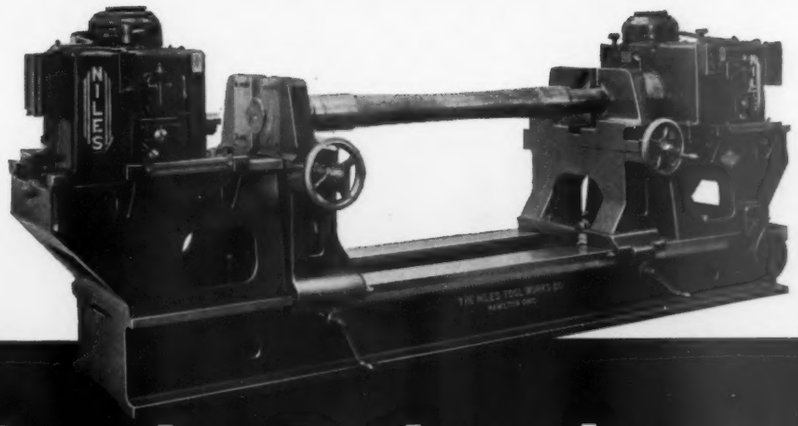
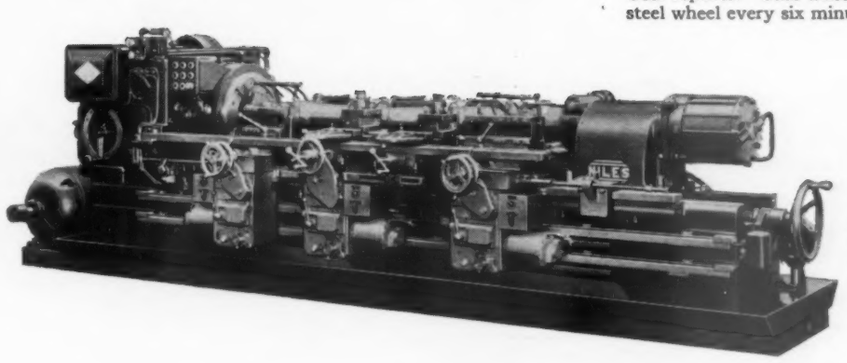


NILES Hydraulic Centering Machine. Centers new axles or renews centers on mounted or unmounted axles prior to turning. Permits easy checking of individual and related concentricity. Action is automatic. Assures high production and uniform dimensional results.

for the Railroads
for the SHOPS
TOOLS

NILES Hydraulic Diesel Wheel Borer. Speeds and feeds designed for carbide tools. Push button chucking and unchucking, automatic boring cycle. User reports: "Cast wheel every four minutes—steel wheel every six minutes."



NILES End Drive Axle Lathe. Developed after extensive research, to speed up this key operation. Machines axles over their entire length in ⅓ to ½ the time ordinarily required. Leaves no indentation from driving jaws.

LIMA-HAMILTON

OFFICES IN PRINCIPAL CITIES

NEWS

Mechanical Division to Speed Up Freight Roller Bearing Development

Railway Mechanical and Electrical Engineer has learned that the Mechanical Division of the Association of American Railroads, is taking steps necessary to speed up the development of roller bearings suitable for application to freight-car journals. The objective is to set up designs and standards for freight-car roller-bearing applications which will meet all interchange requirements. It is understood that a study will be made of the experience of the railroads with passenger cars equipped with roller bearings as well as the experience of railroads which already have roller-bearing installations on freight cars.

The question of per diem adjustments to compensate car owners for the additional cost of building freight cars equipped with roller bearings is to be brought to the attention of the Operating-Transportation Division of the A.A.R.

Present research activities to improve the performance of plain journal bearings are to be continued and such improvements in journal boxes as will be applicable to existing cars which may be expected to complete their service life with plain-type bearings will continue to receive consideration.

Diesel-Electric's Fuel-Cost Advantage Emphasized Again by 1951 Figures

Advantages of diesel-electric locomotives from the standpoint of fuel costs were emphasized again in figures presented by the Interstate Commerce Commission's Bureau of Transport Economics and Statistics in the latest issue of its "Monthly Comment." The figures, covering this year's first four months, show that diesel-electrics then handled nearly half of the road freight service, nearly two-thirds of the yard service, and about 60 per cent of the passenger service, while accounting, respectively, for only 30.8 per cent, 33.4 per cent, and 46.3 per cent of total fuel costs involved.

The analysis of railway fuel costs included two tables, which are reproduced here from the "Comment." In addition to the diesel figures noted above, the data show comparative figures as to services performed and fuel costs incurred by other types of locomotives.

Also, there are the unit-cost figures which show that the fuel cost of performing 1,000 gross ton-miles of road freight service by diesel was 16.6 cents, compared with 33.4 cents and 40.1 cents for coal and oil-burning steam locomotives, respectively. The passenger-service figures are similarly favorable to the diesel, while the yard-service figures are even more favorable.

Allocations Contemplate 9,500 Cars per Month

Steel allocations in the current quarter "should be sufficient for construction in the fourth quarter of about 26,000 freight cars and 2,500 tank cars" the National Production Authority has announced. The third-quarter allocations total 597,000 tons of carbon steel, including 70,000 tons for the tank cars.

A fourth-quarter production of 28,500 cars, which N.P.A. thinks it has provided for, would be a 9,500-car monthly program. The N.P.A. announcement quoted "N.P.A. officials" as having said that this would be "as close to the proposed production of 10,000 cars a month as the short steel situation will permit."

The announcement also gave the monthly car-production figures for this year's first six months, the May and June totals having been 9,774 and 9,644 cars, respectively. The third-quarter alocations are expected to permit maintenance of this "near-10,000 per month level," N.P.A. said again.

The announcement had previously stated that freight car building "takes large quantities of wide steel plate, which is in very short supply." It was explained further that "steel bars and alloy steel are also extensively used and are also in very short supply." The announcement then added: "Since substitutions are in most cases impossible, production of freight cars will continue to be geared to available supplies of steel."

Meanwhile, as the announcement put it, "N.P.A. emphasized" that "production of freight cars is recognized as an important program"; and, "in addition to set-asides for steel, some producers are receiving spot assistance from N.P.A. to assure an orderly flow of production.

Shortages of Alloy Steel Halting Diesel Production

The National Production Authority has been advised by its Locomotive Builders Advisory Committee that "shortages of alloy steel are causing shutdowns of some plants constructing diesel-electric locomotives." This was announced in an N. P. A. statement, reporting on the committee's

SERVICE PERFORMED BY YARD AND TRAIN SERVICE LOCOMOTIVES AND COST OF FUEL CONSUMED — CLASS I ROADS (INCLUDING SWITCHING AND TERMINAL COMPANIES)

First 4 months of 1951—Basic figures in thousands

	Yard service		Road freight service		Road passenger service	
Kind of locomotive	Yard switching locomotive hours	Percent of total	Gross ton-miles, including locomotive and tender	Percent of total	Passenger train car-miles[1]	Percent of total
Coal burning—steam	5,537	28.8	209,338,456	39.4	235,591	21.6
Oil burning—steam	1,041	5.4	56,331,154	10.6	134,358	12.3
Diesel—electric	12,404	64.6	255,640,371	48.1	651,301	59.8
Electric	231	1.2	9,873,332	1.9	68,962	6.3
Total	19,213	100.0	531,183,313	100.0	1,090,212	100.0
			Fuel cost			
Coal burning—steam	$13,571	53.0	$69,919	50.7	$13,429	31.8
Oil burning—steam	3,223	12.6	22,589	16.4	6,718	15.9
Diesel-electric	8,546	33.4	42,436	30.8	19,539	46.3
Electric	259	1.0	2,873	2.1	2,552	6.0
Total	25,599	100.0	137,817	100.0	42,238	100.0

[1] Locomotive propelled trains.

FUEL CONSUMED AND COST PER UNIT OF TRAFFIC — CLASS I ROADS (INCLUDING SWITCHING AND TERMINAL COMPANIES)

First 4 months of 1951

Fuel and power consumed:	Quantities consumed	Cost per unit of traffic[2]
Per yard switching locomotive hour:		
Pounds of coal (steam locomotives)	932	$2.451
Gallons of fuel oil (steam locomotives)	70.67	3.096
Gallons of diesel fuel (diesel locomotives)	7.05	.689
Kilowatt-hours (electric locomotives)	112	1.123
Per 1000 gross ton-miles—road freight service:[1]		
Pounds of coal (steam locomotives)	127	.334
Gallons of fuel oil (steam locomotives)	9.15	.401
Gallons of diesel fuel (diesel locomotives)	1.7	.166
Kilowatt-hours (electric locomotives)	29.06	.291
Per passenger-train car-mile—road passenger service—locomotive propelled trains:		
Pounds of coal (steam locomotives)	21.7	.057
Gallons of fuel oil (steam locomotives)	1.15	.050
Gallons of diesel fuel (diesel locomotives)	0.31	.030
Kilowatt-hours (electric locomotives)	3.7	.037

[1] Represent gross ton-miles including locomotives and tenders.
[2] Includes cost of fuel, including freight and handling charges.

July 6 meeting in Washington, D. C.

The announcement also said that "N. P. A. and the committee agreed that the railroad industry cannot be expected to move defense freight on schedule unless new diesel locomotives are provided."

R. L. Glenn, acting director of N. P. A.'s Railroad Equipment Division, presided at the committee meeting, which was held "to consider methods of conserving critical materials used in locomotive production." On that phase of the meeting, N. P. A.'s press release made this report:

"Large quantities of copper are used but little of it can be substituted for or conserved, members said. Several builders said they are attempting to substitute boron-treated steel for some scarcer alloys but are finding it impossible to get shipments of boron steels.

N.P.A. Sets Up M.R.O. Plan for Railroads

THE National Production Authority on June 28 issued Order M-73 which sets up special arrangements for the distribution of controlled materials to railroad transportation systems for maintenance, repair and operating supplies. Railroad M.R.O. allocations were previously covered by N.P.A.'s Regulation 4 which maintains the M.R.O. set-up applicable to industry generally.

M-73 supersedes Regulation 4 insofar as the latter has applied to railroad companies using more than $25,000 worth of M.R.O. materials in a quarter. As for the under-$25,000 companies, they get the option of operating under either order.

Under the provisions of Order M-73, each road will list it quarterly M.R.O. requirements on a prescribed form NPAF-105. The listings will cover the M.R.O. portion of the present freight-car program as well as requirements for the maintenance of fixed facilities.

N.P.A. suggested that the making of allotments would be "easier" if requirements for all types of work covered were consolidated into one report. The allotments will be "based on the availability of supplies and subject to program determinations by the Defense Production Administration," N.P.A. also said. It had previously noted that the principal controlled-materials item involved in the quarterly distribution will be about a million tons of carbon steel.

N. P. A. said that boron and vanadium steels are in good supply and officials promised to investigate conflicting reports on the availability of boron steel."

It was also reported that "N. P. A. officials said they would consider steps to relieve the pressing shortage of steel for locomotive builders."

John Morris Gets Diesel Award

In recognition of his leadership in diesel locomotive development in this country, J. P. Morris, general manager, mechanical, Atchison, Topeka & Santa Fe, was awarded

SELECTED MOTIVE POWER AND CAR PERFORMANCE STATISTICS

Item No.		Month of March 1951	Month of March 1950	3 months ended with March 1951	3 months ended with March 1950
	Freight Service (Data from I.C.C. M-211 and M-240)				
3	Road locomotive miles (000) (M-211):				
3-05	Total, steam	28,995	29,197	82,443	78,496
3-06	Total, Diesel-electric	22,032	16,974	60,967	46,871
3-07	Total, electric	878	891	2,415	2,335
3-04	Total, locomotive-miles	51,915	47,071	145,831	127,713
4	Car-miles (000,000) (M-211):				
4-03	Loaded, total	1,851	1,599	5,110	4,217
4-06	Empty, total	925	830	2,450	2,285
6	Gross ton-miles-cars, contents and cabooses (000,000) (M-211):				
6-01	Total in coal-burning steam locomotive trains	49,499	48,538	138,800	119,632
6-02	Total in oil-burning steam locomotive trains	13,371	11,803	35,497	32,803
6-03	Total in Diesel-electric locomotive trains	62,053	48,118	169,111	130,919
6-04	Total in electric locomotive trains	2,434	2,311	6,610	5,956
6-06	Total in all trains	127,400	110,799	350,093	289,352
10	Averages per train-mile (excluding light trains) (M-211):				
10-01	Locomotive-miles (principal and helper)	1.05	1.05	1.05	1.05
10-02	Loaded freight car-miles	39.60	38.20	39.10	36.80
10-03	Empty freight car-miles	19.80	19.90	18.70	20.00
10-04	Total freight car-miles (excluding caboose)	59.40	58.10	57.80	56.80
10-05	Gross ton-miles (excluding locomotive and tender)	2,725	2,649	2,676	2,528
10-06	Net ton-miles	1,263	1,218	1,253	1,128
12	Net ton-miles per loaded car-mile (M-211)	31.90	31.90	32.10	30.60
13	Car-mile ratios (M-211):				
13-03	Per cent loaded of total freight car-miles	66.70	65.80	67.60	64.90
14	Averages per train hour (M-211):				
14-01	Train miles	16.90	16.60	16.60	17.00
14-02	Gross ton-miles (excluding locomotive and tender)	45,410	43,296	43,935	42,304
14	Car-miles per freight car day (M-240):				
14-01	Serviceable	48.50	44.30	45.40	40.70
14-02	All	46.40	41.10	43.30	37.70
15	Average net ton-miles per freight car-day (000) (M-240)	986	863	940	749
17	Per cent of home cars of total freight cars on the line (M-240)	35.80	43.60	34.90	48.80
	Passenger Service (Data from I.C.C. M-213)				
3	Road motive-power miles (000):				
3-05	Steam	11,404	11,241	34,229	32,592
3-06	Diesel-electric	16,189	14,538	46,231	41,649
3-07	Electric	1,706	1,647	4,851	4,755
3-04	Total	29,300	27,426	85,311	78,996
4	Passenger-train car-miles (000):				
4-08	Total in all locomotive-propelled trains	285,378	264,851	821,015	765,490
4-09	Total in coal-burning steam locomotive trains	60,888	57,681	181,791	162,314
4-10	Total in oil-burning steam locomotive trains	34,533	34,687	101,872	104,796
4-11	Total in Diesel-electric locomotive trains	171,356	154,407	485,680	446,222
12	Total car-miles per train-miles	9.60	9.39	9.51	9.43
	Yard Service (Data from I.C.C. M-215)				
1	Freight yard switching locomotive-hours (000):				
1-01	Steam, coal-burning	1,406	1,476	4,089	4,086
1-02	Steam, oil-burning	263	231	740	667
1-03	Diesel-electric[1]	3,036	2,418	8,557	6,812
1-06	Total	4,733	4,153	13,468	11,643
2	Passenger yard switching hours (000):				
2-01	Steam, coal-burning	54	63	161	190
2-02	Steam, oil-burning	14	14	41	40
2-03	Diesel-electric[1]	250	226	712	660
2-06	Total	354	338	1,014	992
3	Hours per yard locomotive-day:				
3-01	Steam	8.40	7.70	8.40	7.30
3-02	Diesel-electric	18.20	17.60	17.80	17.30
3-05	Serviceable	14.90	14.20	14.70	13.70
3-06	All locomotives (serviceable, unserviceable and stored)	12.90	11.60	12.70	11.20
4	Yard and train-switching locomotive-miles per 100 loaded freight car-miles	1.76	1.80	1.82	1.90
5	Yard and train-switching locomotive-miles per 100 passenger train car-miles (with locomotives)	0.77	0.79	0.77	0.80

[1] Excludes B and trailing A units.

ORDERS AND INQUIRIES FOR NEW EQUIPMENT PLACED SINCE THE CLOSING OF THE JULY ISSUE

DIESEL-ELECTRIC LOCOMOTIVE ORDERS

Road	*No. of units*	*Horsepower*	*Service*	*Builder*
Baltimore & Ohio	8[1]	1,200	Switch	Electro-Motive
	18A	1,500	Freight	Electro-Motive
	9B	1,500	Freight	Electro-Motive
	6A	1,600	Freight	Alco-G. E.
	3B	1,600	Freight	Alco-G. E.
	2A	1,600	Freight	Baldwin-Lima-Hamilton
	1B	1,600	Freight	Baldwin-Lima-Hamilton
	5	1,600	Road switch	Baldwin-Lima-Hamilton
Chicago, Milwaukee, St. Paul & Pacific	08[2]	1,500	Freight	Electro-Motive
	18	1,500	Passenger	Electro-Motive
	12	1,500	Road switch	Electro-Motive
	3	1,200	Switch	Electro-Motive
	10	1,200	Switch	Fairbanks, Morse
	10	1,000	Switch	Alco-G. E.
	7	1,200	Switch	Baldwin-Lima-Hamilton
Lehigh & Hudson River	2[3]	1,600	Road switch	Alco-G. E.
Maine Central	1[4]	1,200		Electro-Motive
	1	1,500		Electro-Motive
New York, New Haven & Hartford	10[5]	1,600	Road switch	Alco-G. E.
	5B	1,600	Road freight	Alco-G. E.
Northern Pacific	3[6]	1,200	Switch	Electro-Motive
	4	1,500	Road switch	Electro-Motive
	1B	1,500	Freight	Electro-Motive
	4A	1,500	Freight	Electro-Motive
	4B	1,500	Freight	Electro-Motive
	2A	1,500	Passenger	Electro-Motive
	1B	1,500	Passenger	Electro-Motive
	4	1,000	Switch	Alco-G. E.

(Continued on p. 110)

CLEAN WITH SAFETY

Eliminate equipment damage with economical, corrosion-free DEARBORN cleaners

Remove dirt and grime . . . leave equipment bright, sparkling . . . without danger of subsequent corrosion. Dearborn cleaners work in any water, are free-rinsing, leave no streaks, contain no abrasives.

■ **EXTERIOR CLEANERS.** Contain non-streaking and sheen-producing agents. Formulated to keep painted, lacquered and polished metal surfaces sparkling new.

■ **INTERIOR CLEANERS.** Detergent and solvent type materials for interior cleaning of Diesel locomotives, passenger and baggage cars, roundhouses and offices. Designed for safety and economy.

■ **ORGANIC SOLVENT TYPE CLEANERS.** For cold cleaning of Diesel parts and filters at terminals lacking heating facilities. Also for cleaning Diesel trucks, Diesel locomotive interiors, traction motor gears, steam locomotive running gear, etc., where excessive oil and grease are present.

■ **HOT TANK CLEANERS.** For use on steam locomotive side rods, wheels and other parts that become heavily coated with grease and dirt. Also long life materials for cleaning air filters, oil and sintered bronze filters and specialized formulas for non-ferrous metals.

■ **ELECTRICAL PARTS CLEANERS.** A special solvent of low toxicity for spray cleaning of electrical cabinet interiors, relays, motor windings, other electrical equipment. Removes tarnish and oily film. Will not harm insulation.

■ **SCALE REMOVER CLEANERS.** For removing scale from Diesel cooling systems with acid pump. A ferrous cleaner, it may be safely used for cleaning units constructed of copper, bronze, brass or their alloys.

Dearborn cleaners are designed for use with the most modern equipment such as this mechanical car washer.

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—Call your Dearborn Engineer or write for complete information on how to "Clean with SAFETY."

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THE LEADER IN WATER TREATMENT AND RUST PREVENTIVES

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☐ Have a Dearborn Engineer call

Name.....

Railroad.....

Address.....

City.....*State*.....

ORDERS AND INQUIRIES FOR NEW EQUIPMENT PLACED SINCE THE CLOSING OF THE JULY ISSUE *(cont'd.)*

Richmond, Fredericsburg & Potomac	6[7]	2,250	Road	Electro-Motive
Texas & Pacific	6[8]	1,500	Freight	Electro-Motive
	6	1,500	Road switch	Electro-Motive
	8	800	Switch	Electro-Motive

FREIGHT-CAR ORDERS

Road	*No. of cars*	*Type of car*	*Builder*
Baltimore & Ohio	500[1]	70-ton covered hopper	Greenville Steel Car
Denver & Rio Grande Western	1,000[9]	70-ton gondola	General American
Department of the Army	418	50-ton box	Pullman-Standard
New York, New Haven & Hartford	55[5]	70-ton hopper	Pullman-Standard
St. Louis-San Francisco	100[10]	50-ton pulpwood	Company shops
Wabash	1,000[11]	50-ton box	American Car & Fdry.
	300	50-ton box	General American

FREIGHT-CAR INQUIRIES

Denver & Rio Grande Western	25	70-ton covered hopper
Detroit, Toledo & Ironton	100	70-ton covered hopper

PASSENGER-CAR ORDERS

Road	*No. of cars*	*Type of car*	*Builder*
New York, New Haven & Hartford	1	Diesel rail	Mack Trucks
Union Pacific	16	Sleeping	American Car & Fdry.
	2	Dining	American Car & Fdry.
	2	Dormitory-kitchen	American Car & Fdry.
	4	Dining	American Car & Fdry.
	14	Coaches	American Car & Fdry.
	10	Baggage	American Car & Fdry.
	2	Railway postoffice	American Car & Fdry.

[1] The eight 1,200 switchers are scheduled for delivery beginning in November and for use on the Baltimore & Ohio Chicago Terminal. Cost, about $849,000. Six of the other electro-motive units are scheduled for delivery in the first quarter, and 21 in the third quarter of 1952. The Alco-G. E. units are for delivery in February 1952. The B.-L.-H. freight units are scheduled for delivery next April and the road-switching units next February. Delivery of the hopper cars is expected to begin during the third quarter of 1952.

[2] For delivery between September 1951 and May 1952.

[3] Approximate cost, $294,000. One unit scheduled for delivery in July and one in October.

[4] The 1,200-hp. unit is scheduled for delivery in August and the 1,500-hp. unit in October.

[5] The locomotives are scheduled for delivery in November and December. The self-propelled diesel rail car will be equipped with a Mack bus body, P.C.C. street car trucks and diesel-electric power. It will have a capacity of about 45 passengers. The New Haven is also equipping 65 baggage cars for express messenger and baggageman service. The hopper cars will cost about $3,465,000.

[6] Deliveries scheduled to begin next April and be completed the following October.

[7] Approximate cost, $1,450,000. Two locomotives scheduled for delivery next January and the third in July 1952.

[8] For delivery during the first quarter of 1952.

[9] Estimated cost, $7,000,000. Delivery scheduled for the third quarter of 1952.

[10] Construction scheduled to begin during the third or fourth quarter of this year, depending upon receipt of the necessary materials.

[11] Delivery of equipment in both orders expected during the second quarter of 1952.

NOTES:

Canadian National.—As a result of a study, completed in April, of equipment needs, the Canadian National has recommended that normal purchase for the next five years should include 4,360 new freight cars per year. Of this number, 2,500 would offset annual retirements for obsolescence and other causes; the rest are considered necessary to accommodate an estimated 10 per cent in business, at the rate of two per cent a year for the next five years. Approximately 30 new baggage cars a year will be needed to provide for average annual retirements and to bring this class of equipment to approved passenger train standards.

New York & Long Branch.—The New Jersey Board of Public Utility Commissioners has approved a $5,000,000 improvement program for Pennsylvania trains serving the north New Jersey coast via the New York & Long Branch. Included in the program for 1951 is complete overhauling of 23 steam locomotives and assignment of 10 additional modernized, air-conditioned coaches to supplement 48 similar cars now in service. Twenty more air-conditioned coaches will be added in 1952 and 20 more in the following year.

U. S. Army Transportation Corps.—Officers of the U. S. Army Transportation Corps have taken delivery of two new Unicel freight cars which have just been purchased. Col. Emil Ringberg, A.T.C., said the army plans to move the new cars to Fort Eustis, near Norfolk, Va., for additional tests which will be made as soon as possible because of the nation's urgent defense transportation needs. The results of official A.A.R. tests of the Unicel car being made on the Chicago, Milwaukee, St. Paul & Pacific, are expected to be made known shortly.

a bronze plaque at the regular June meeting of the St. Louis Railroad Diesel Club. The inscription on the plaque was worded as follows: "To John P. Morris, June 12, 1951—In recognition of his outstanding contribution to the advancement of the diesel locomotive. St. Louis Railroad Diesel Club."

In addressing the club, Mr. Morris reviewed early difficulties and experiences with diesel locomotives, described the important part the new power has played in rail transportation and emphasized the need for adequate servicing and repair facilities as well as organizations trained to secure maximum utilization. Illustrative of stepped-up maintenance requirements, he said that 210 diesel units in addition to 11 assigned units and 35 switchers are now being given running repairs at Argentine, Kan., where a 3.5-million-dollar modern heavy repair and maintenance diesel shop is scheduled for completion in 1953 with capacity for handling 600 units which will be required when that territory is completely dieselized.

A.A.R. Divisions May Go To Atlantic City in 1953

In connection with the Eighth Pan-American Railway Congress to be held in Atlantic City, N. J., during the week of June 19, 1953, plans are being considered for meetings at the same time and place ac- P. & S. Division to hold their 1953 annual the A.A.R. Mechanical Division and the companied by an extensive exhibit of railway equipment and supplies. The 1952 annual meetings of the two A.A.R. divisions mentioned are expected to be held in Chicago without exhibits.

More Time for AB Brake Installations

DIVISION 3 of the Interstate Commerce Commission has given railroads and other car owners more time to complete installation of AB brakes on their freight cars. A June 5 order in the No. 13528 proceeding set back the deadline date for six months—from December 31, 1951, to June 30, 1952.

The order will also prohibit movement after June 30, 1952, of any unequipped car owned by a railroad—"unless such car is received in interchange from a line other than the owning line or unless such car is moved over its own rails by an owning line." After December 31, 1952, any movement of any unequipped car "used in freight service (including the cars of private car line companies)" will be prohibited.

Miscellaneous Publications

ENGINEERING STANDARDS FOR MULTIPLE V-BELT DRIVE: Published by Rubber Manufacturers Association, 444 Madison avenue, New York 22, and Multiple V-Belt Drive & Mechanical Power Transmission Association, 7 West Madison street, Chicago 2. 16-page manual. Price, $1 or two copies. Contains recommended Standards as developed and approved by the technical committees of both associations. Indicates proper sheaves and belts to be used for optimum efficiency and economy of complete drive in relation to particular duty required.

SUPPLY TRADE NOTES

PRESSED STEEL CAR COMPANY. — The Pressed Steel Car Company has acquired the Chicago Steel Tank Company. The acquisition includes two subsidiary companies, Steel Erectors, Inc., which operates as a field installation arm of the parent company, and Conduit Fittings Corporation, makers of parts for electricial appliances and systems.

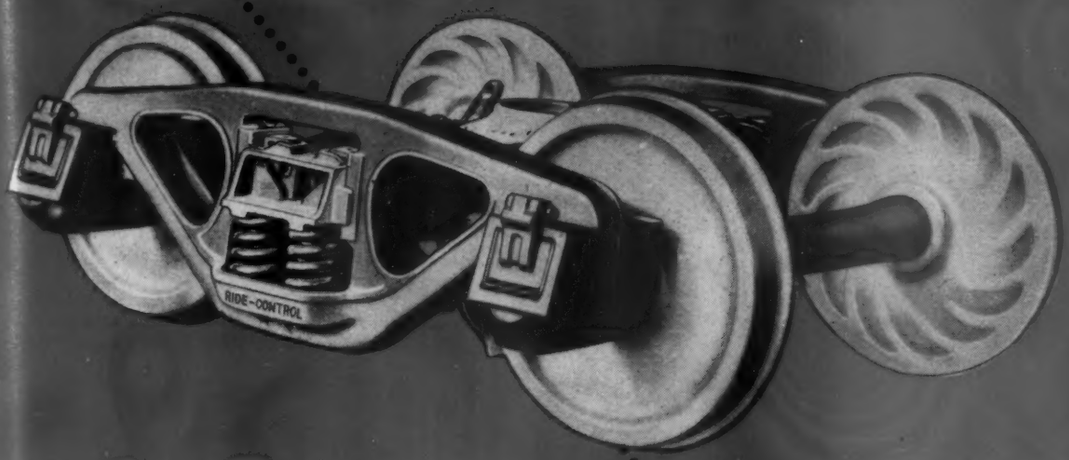
◆

HELI-COIL CORPORATION.—*Eugene M. Lang* has been elected vice-president in charge of manufacturing of the Heli-Coil Corporation of Long Island City, N. Y. *Louis K. Rimer*, former vice-president in charge of operations of Elgin American Company, Elgin, Ill., succeeds Mr. Lang as works manager and has been elected assistant secretary of the corporation.

Cr. Lang, former works manager at the Heli-Coil plant, has served the firm in various executive and production capacities since 1941. Prior to that time he was a management consultant to chemical and metal-fabricating firms and an industrial analyst for several trade publications.

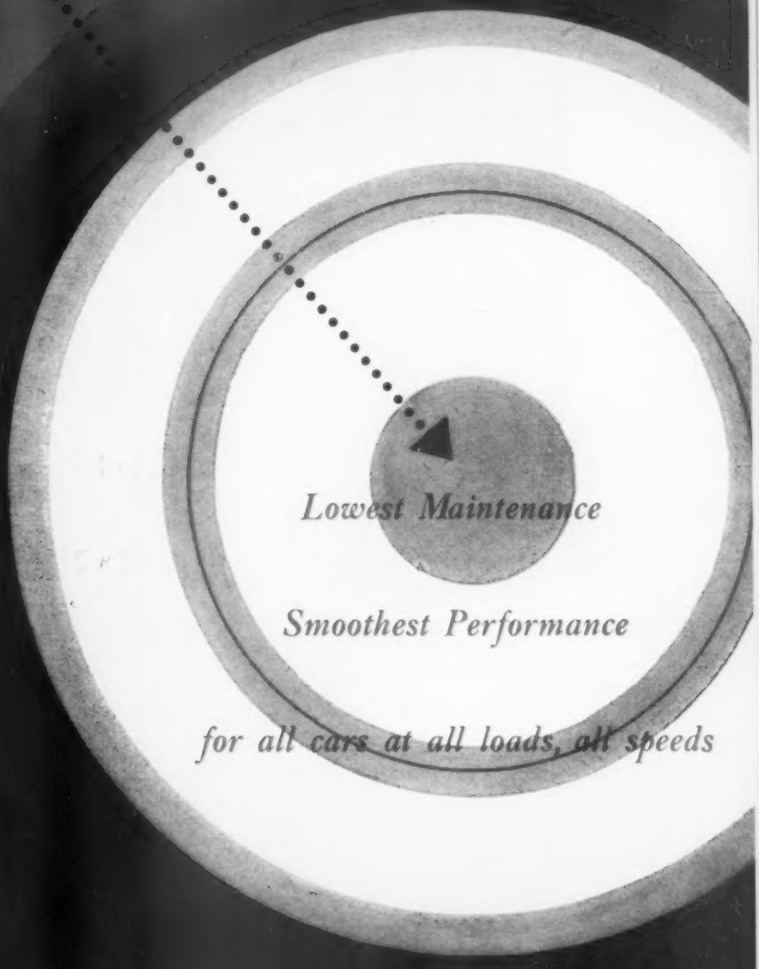
◆

FARR COMPANY.—The new main factory and office building of the Farr Company in El Segundo, Cal., has been completed as has also the transfer of its factory on Southwest Drive in Los Angeles. Facilities in the new plant include executive and general offices, a research laboratory, an



On-Target Design

makes the A·S·F Ride-Control® Truck a standout by every comparison



However you judge a freight car truck —by simplicity, fine riding qualities, or economy—you'll find Ride-Control at the top of the list, as it has been from the first.

So well does this modern, smooth-riding truck serve railroading's various needs that, today, it is specified in *far greater* volume than all other freight trucks combined.

Billions of profitable, low-cost miles prove performance beyond all question . . . performance that proves the value to you of A.S.F. *objective* designing.

AMERICAN STEEL FOUNDRIES

Mint Mark of ⬡ *Fine Products*

engineering and designing department, and specially planned manufacturing areas. The plant has a floor area of approximately 50,000 sq. ft. Further expansion on the same property is planned for the future.

◆

PEERLESS EQUIPMENT COMPANY.—*Norman T. Olsen* has been elected vice-president of the Peerless Equipment Company as announced in the June issue of *Railway Mechanical & Electrical Engineer*.

Prior to becoming associated with Peerless. Mr. Olsen was chief mechanical engineer of the Chicago & North Western and the Chicago, St. Paul, Minneapolis & Omaha. He started his career in 1923 as a draftsman on the North Western. For a time

Norman T. Olsen

during 1935 and 1936 he served as a draftsman with the Chicago, Rock Island & Pacific. In 1944 Mr. Olsen became principal engineer for the North Western, and in 1947 was appointed chief mechanical engineer.

◆

TURCO PRODUCTS, INC.—*Donald A. Keating* has been appointed railroad division sales manager of Turco Products, Inc., at Los Angeles.

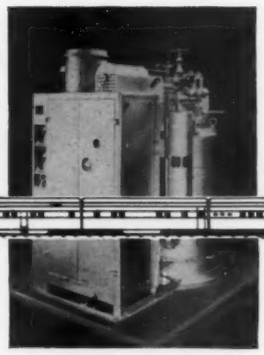
Mr. Keating joined Turco in 1946 and worked in the Chicago division as technical

Donald A. Keating

representative for the mid-west states, and in Los Angeles, both as process engineer and assistant technical department manager, handling direction of the development and control sections of that department.

◆

DOUBLE SEAL RING COMPANY.—*Buyrl Wilson*, general sales manager for the



"Pint-size" steam generator warms a whole diesel train

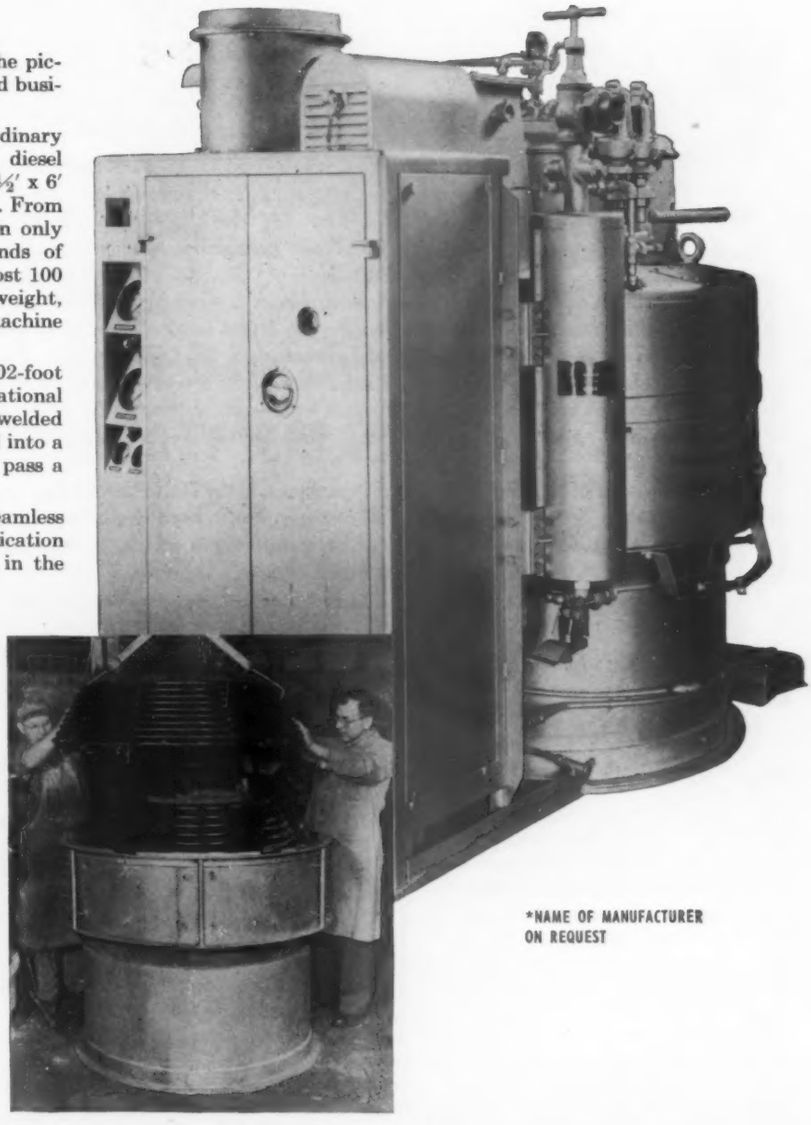
That Vapor-Clarkson steam generator* in the picture has caused a real stir both in the railroad business and out of it.

Even though it's no bigger than an ordinary clothes closet, it does the one big job a diesel locomotive can't do by itself—this 3½′ x 5½′ x 6′ generator can heat an entire train. Fast, too. From a cold start, it will deliver 200 psi steam in only two minutes. Capacity is over 4500 pounds of steam per hour. That's enough to heat almost 100 homes in dead zero weather. For size and weight, this is the most powerful steam-making machine developed by industry.

Heart of this ingenious generator is a 702-foot long set of continuous coils made from National Seamless Steel Tubing. Standard lengths are welded into 200 or 300 foot lengths, then cold rolled into a coil. All coils are interchangeable. All coils pass a 1200 pound hydrostatic pressure test.

This is another instance of National Seamless doing a fine job, despite the exacting fabrication methods and rigorous tests. The reason is in the tubing itself—in that magic word, "Seamless." There aren't any longitudinal welds to weaken the tube. Each tube is pierced from a solid billet of steel . . . the *one* method that removes all doubt concerning wall strength.

When planning the use of seamless pipe or tubing for future needs, be sure to specify National Seamless, made by the world's largest and most experienced manufacturer of tubular steel products.



*NAME OF MANUFACTURER ON REQUEST

NATIONAL TUBE COMPANY, PITTSBURGH, PA.
(Tubing Specialties Division)
COLUMBIA STEEL COMPANY, SAN FRANCISCO
PACIFIC COAST DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS TRADE MARK

NATIONAL *Seamless* PIPE AND TUBES

UNITED STATES STEEL

B. Wilson

Double Seal Ring Company for the past eight years, has been appointed vice-president in charge of sales.

◆

EX-CELL-O CORPORATION.—*Donald H. McIver* who has been elected vice-president in charge of industrial sales, as announced in the July issue of *Railway Mechanical and Electrical Engineer* was born in Glasgow, Scotland, in 1906. He attended Cleveland, Ohio, schools and is a graduate of Ohio Northern University (1929) with the degree of Bachelor of Science in Mechanical Engineering. He joined Ex-Cell-O in 1929 and embarked upon an intensive two-year training program. In 1931 he was put in charge of the production control department until, in 1934, he moved to the sales department. He was appointed assistant to the vice-president in charge of sales in 1937, sales manager of the Precision Products division in 1947, and sales manager of the Industrial Division of Ex-Cell-O in 1949.

◆

AIRETOOL MANUFACTURING COMPANY.—The Airetool Manufacturing Company, Springfield, Ohio, has acquired the Ajax Expander Company of Fairview, Pa. The manufacturing facilities and inventory of Ajax have been moved to the Springfield plant where Airetool will continue to produce and stock the Ajax "Collins Type" and "C. B.," "P. R." and Linsen series of tube expanders.

◆

WESTINGHOUSE ELECTRIC CORPORATION.—The Westinghouse Electric Corporation recently opened a new office in the Merchandise Mart, Chicago. The firm's northwestern district headquarters were formerly located at 20 North Wacker drive.

◆

AMERICAN CAR & FOUNDRY CO.—*William M. Hawkins*, laboratory director at Berwick, Pa., has been appointed senior research engineer at New York in the research and development department. *George Reed*, manager of inspection, succeeds Mr. Hawkins at Berwick but with the title of manager, general laboratories. *Sheldon Thomas*, formerly resident representative at the Chicago plant, has been appointed manager of inspection, succeeding Mr. Reed.

◆

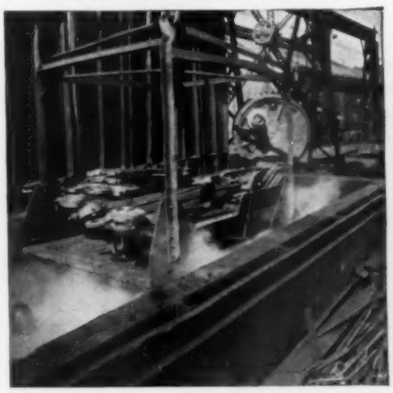
GRAYBAR ELECTRIC COMPANY.—*W. E. Guy*, district sales manager of the Graybar

the BIG BOY of the railroads does a BIG cleaning job ...with PENNSALT CLEANER 45-X

The Pennsylvania Railroad's Altoona, Pa., shops contain a battery of cleaning vats . . . including the largest soak cleaning tank in the world. Into these tanks goes a wide variety of locomotive and car parts, hard-caked with grime and road dirt. Within a matter of hours, out they come again . . . clean and ready for inspection and service.

For 11 years, the Pennsylvania has used Pennsalt Cleaner 45-X in this installation for tough cleaning operations. Especially designed for heavy duty work, 45-X is ideally suited for such railroad cleaning. It is concentrated, free-flowing, virtually anhydrous and has high emulsifying power. It is in use on many of the country's leading roads.

Pennsalt has thoroughly trained service representatives . . . well equipped to help you with your cleaning problems. They'll be glad to set up tests to determine how Pennsalt Cleaners may give you better, faster cleaning. Write to Maintenance Chemicals Dept., Pennsylvania Salt Manufacturing Company, Philadelphia 7, Penna.



A basket-load of main rods, side rods and valve gear stripped clean of grime and road dirt.

Hosing down a cleaned load of miscellaneous parts: crossheads, guides, brake beams, superheaters.

railroad maintenance cleaners by

PENNSALT CHEMICALS

for industry · Agriculture · Health · Home

Progressive Chemistry for over a Century

Electric Company, at Chicago, has been appointed assistant district manager of the Chicago district; *L. C. Esthus*, branch manager at Des Moines, Iowa, has been appointed district sales manager at Chicago, succeeding Mr. Guy, and *D. M. Hitchcock*, of San Francisco, Cal., has been transferred to Des Moines to succeed Mr. Esthus.

◆

S. KARPEN & BROS.—A syndicate, headed by Jay Levine and David Berdon of New York, which is the principal shareholder of International Furniture Company, has purchased the business of S. Karpen & Bros., manuafcturers of transportation seating and other furniture. Terms of the sale were not made public.

"We will preserve the Karpen name in our merchandising, and we will continue the Karpen line of goods," Mr. Levine declared in announcing the transaction. He added that activities of International and Karpen, if approved by the stockholders, will be coordinated, but that two separate sales divisions will be maintained.

◆

EDGEWATER STEEL COMPANY.—*H. C. Riddile*, formerly general manager of Edgewater Steel, has been elected vice-president in charge of manufacturing. *B. T. Roe*, formerly vice-president of the Tracy Manufacturing Company whose assets Edgewater acquired recently, has been elected vice-president in charge of sales of the Tracy Division. *H. H. Soloj*, formerly vice-president of Tracy has been elected assistant to the president. *B. J. Krywick*, formerly vice-president of Tracy, has been appointed general manager of the Tracy Division.

◆

NATIONAL STEEL CAR CORPORATION.—*Alex P. Shearwood* has been appointed vice-president of the National Steel Car Corporation of Montreal, Que., and Hamilton, Ont. as announced in the July issue of *Railway Mechanical and Electrical Engineer*.

Mr. Shearwood worked for the Dominion Bridge Company in 1927 and 1928 and for the Canadian Pacific in 1929 and 1930. He is a graduate of McGill University in arts

Alex P. Shearwood

(1930) and engineering (1932). In June 1932, he joined the engineering department of National Steel Car at Hamilton. He was transferred to the Montreal office in 1934 and was appointed mechanical assistant to the president in 1939 and general sales manager in 1947.

(Continued on p. 118)

NEW GRINDER SAFETY with GREATER POWER

INGERSOLL-RAND *introduces*
ANOTHER BIG FIRST... the NEW
OVERSPEED SAFETY COUPLING...

The Overspeed Safety Coupling supplements, and is completely independent of, the regular factory-set weight type governor used in Ingersoll-Rand Air Tools.

This built-in unit, which operates in case of failure of the regular governor, eliminates the possibility of dangerous overspeed operation. If, for any reason, the motor speed exceeds the safe wheel speed, the NEW Overspeed Safety Coupling automatically uncouples the arbor and the wheel from the motor, making it impossible to operate the Grinder until the cause of overspeeding has been corrected.

GRINDER OPERATORS *Also Asked for* THESE *Extra* FEATURES

LONG LIFE ARBOR CONSTRUCTION—Widely spaced, permanently lubricated, precision ball bearings are located at each end of the arbor in a one-piece housing to provide new rigidity and longer Grinder life.

20% MORE POWER—A new, larger, four-vane, swastika-type motor gives 20% more power. Extensive use of light weight alloy castings results in more horsepower per pound. Grinding efficiency goes up and grinding costs come down.

QUIETER EXHAUST—It takes 10 of these new Grinders to produce exhaust noise equal to 1 of the previous machines. The low exhaust noise which is present, is pitched so as not to be irritating.

EXTRA EXHAUST POSITIONS—The operator can choose any one of four exhaust positions, spaced 90 degrees apart.

RUBBER-FACED VALVE—The new composition rubber-faced throttle valve closes properly even if small particles of foreign matter adhere to the valve seat. Replacement is inexpensive, and no lapping is necessary.

OPTIONAL HANDLE—In addition to the popular grip handle, a straight handle with a new safety-throttle lock is available.

Call us today and arrange for a demonstration of this powerful new Series 4 Air Grinder.

Ingersoll-Rand

630-B

11 BROADWAY, NEW YORK 4, N. Y.

A. O. SMITH CORPORATION.—*R. C. Roderick*, formerly head of distribution service at A. O. Smith Corporation's Water Heater division, Kankakee, Ill., has been appointed manager of the Railroad Products division. He succeeds *George B. Peet* who becomes project manager of development programs for the Railroad Products and Welding Products divisions. Mr. Peet functions also as assistant to J. J. Bohmrich, group executive for Railroad Products, Welding Products and Product Service divisions.

◆

YOUNGSTOWN SHEET & TUBE CO.—*Paul B. Baird*, formerly assistant manager of standard pipe sales for the Youngstown Sheet & Tube Co., has been promoted to manager of standard pipe sales, succeeding the late *Glenn W. Christopher*. *Carl T. Selander*, formerly western representative for standard pipe products, succeeds Mr. Baird as assistant manager of standard pipe sales at Chicago.

◆

ALLIS-CHALMERS.—*Chester W. Schweers* has been appointed director of sales of Allis-Chalmers general machinery division at Milwaukee, Wis.

◆

RAILROAD SUPPLY & EQUIPMENT, INC.—*Russell O. Nash*, of St. Louis, has joined Railroad Supply & Equipment, Inc., Scranton, Pa., as sales engineer.

WESTINGHOUSE AIR BRAKE COMPANY.—*E. A. Frauenthal* has been appointed assistant manager of the southwestern district of the Westinghouse Air Brake Company, with headquarters in St. Louis, and *R. M. Beswick* has been appointed assistant manager of the southeastern district, with offices in Washington, D. C.

Mr. Frauenthal has been the company's representative in the southwestern district

E. A. Frauenthal

since 1932, prior to which he was active in the St. Louis office in several capacities since joining the American Brake Company in 1917.

Mr. Beswick has been the Washington representative since 1947. He became associated with the company in 1929. He

R. M. Beswick

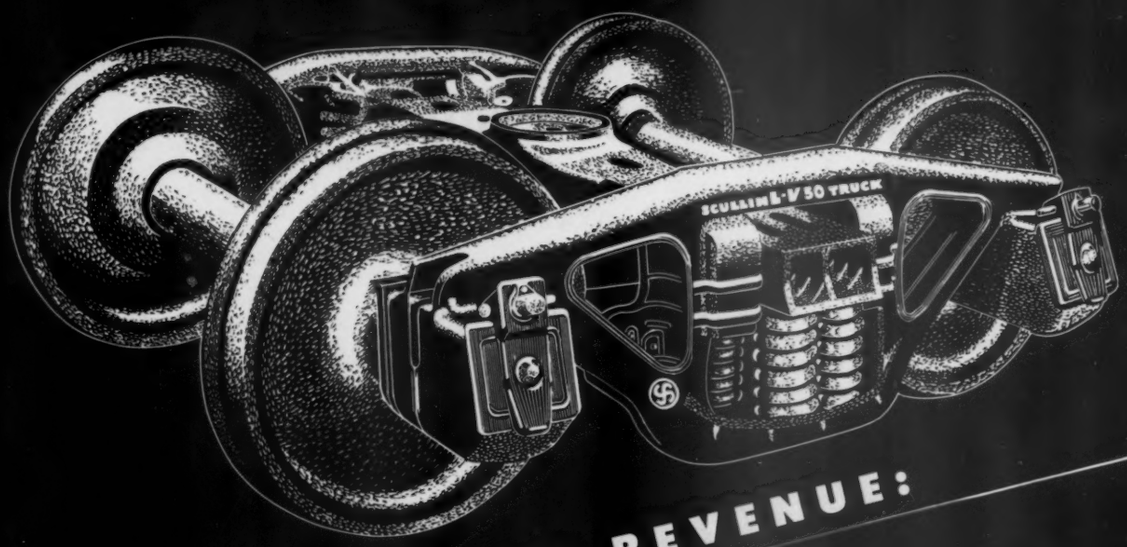
served in various capacities in Engineering and Test divisions in Wilmerding, was transferred to New York as service engineer in 1939, and was later appointed assistant to district engineer New York. He was transferred to Washington as representative on January 1, 1947.

◆

DOW CHEMICAL COMPANY.—A wood preservation laboratory has been established within the biochemical research deparment of the Dow Chemical Company, under direction of *Fred J. Meyer*, assistant by *Ralph M. Gooch*.

◆

ST. LOUIS CAR COMPANY.—Lafayette College, Easton, Pa., has purchased the St. Louis Car Company, of St. Louis, Mo., through acquistion of stock formerly owned by Edwin B. Meissner, Sr., and Edwin B.



FOR MORE REVENUE:

new high speed track PLUS SCULLIN L-V 50 TRUCKS

LATERAL VERTICAL 50 CUSHIONED MOTION

THE SMOOTHEST TRAFFIC-BUILDERS BETWEEN LCL AND YOUR RAILS

Photo Courtesy Cotton Belt Route

STEEL CASTINGS MANUFACTURER

NEW YORK
CHICAGO
BALTIMORE
RICHMOND, VA.

SCULLIN STEEL CO.

SAINT LOUIS 10, MISSOURI

Meissner, Jr., president and executive vice-president, respectively, of the car company. There will be no changes in the company's present organization.

◆

FAIRBANKS, MORSE & CO.—*Charles A. Mapp* has been appointed district manager of locomotive sales in the Chicago area for Fairbanks, Morse & Co., as announced in the July issue of *Railway Mechanical & Electrical Engineer*.

He succeeds *C. H. Morse, Jr.*, who was recently appointed manager of the service department of the company's Locomotive Division.

Mr. Mapp is a graduate of Duke University (1943) with the degree of Bachelor of Science, Mechanical Engineering. In his

C. A. Mapp

first job he worked on the Manhattan Project, Oak Ridge. The next couple of years were spent with the Navy as Lieutenant (j.g.) on a landing craft. He joined Fairbanks, Morse in the Locomotive Service department in 1947, and was later promoted to sales representative, Cleveland area.

◆

THOMAS A. EDISON, INC.—*O. P. Rose*, formerly sales engineer with the Primary Battery division of Thomas A. Edison, Inc.,

O. P. Rose

has been appointed district manager of St. Louis, succeeding *Bedford F. Hines*, who has retired after 34 years of continuous service with the company.

◆

INLAND STEEL COMPANY.—*John F. Smith, Jr.*, general manager of sales of the Inland Steel Company, has been granted a leave

of absence for six months to serve as chairman of the production directive committee and as assistant director of the iron and steel division of the National Production Authority, in Washington, D. C.

◆

DOMINION BRAKE SHOE COMPANY.—*Maurice N. Trainer,* formerly president of the Dominion Brake Shoe Company, a subsidiary of the American Brake Shoe Company, has been elected chairman of the board, and *Thomas E. Akers,* formerly vice-president, has been elected president.

Mr. Akers joined American Brake Shoe

Thomas E. Akers

in 1902. He advanced through various sales and supervisory jobs, successively, to vice-president of the Ramapo Ajax division, president of the Canadian Ramapo division, and vice-president of Dominion Brake Shoe.

◆

BRIDGEPORT BRASS COMPANY.—*L. E. Menns* has been appointed Pacific Coast sales manager of the Bridgeport Brass Company. Mr. Menns, who has been serving as Los Aangeles district manager for Bridgeport, will be in charge of the San Francisco district office and warehouse as well, and will be responsible for sales of all Bridgeport products on the Pacific Coast.

◆

AMERICAN LUMBER & TREATING COMPANY.—*Bradley A. Burnside* has joined the sales department of the American Lumber & Treating Co. with headquarters at Chicago, as assistant to *R. B. Putnam,* general sales manager.

◆

GENERAL ELECTRIC COMPANY.—The *Machinery & Welder Corp.,* St. Louis, has been appointed by the General Electric Company as a distributor for G-E stainless-steel arc welding electrodes in addition to the older line of G-E arc-welding equipment and mild-steel electrodes. Stocks of the electrodes will be maintained in warehouses in Chicago, Milwaukee, St. Paul, Moline, Ill., and St. Louis.

◆

TRANSPORTATION SPECIALTIES COMPANY. *Robert B. Borucki,* chief mechanical engineer of the Transportation Specialties Company, has been named to vice-president. Mr. Borucki served as mechanical drafts-

STANDARD ENGINEER'S REPORT

DATA

LUBRICANT R.P.M. Delo Oil R.R.

UNIT Diesel Locomotive cylinder assembly

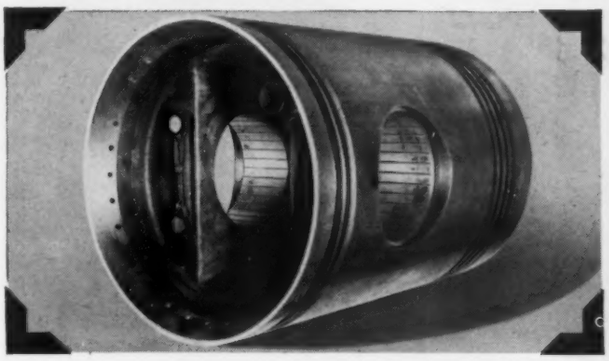
SERVICE Mountain Freight

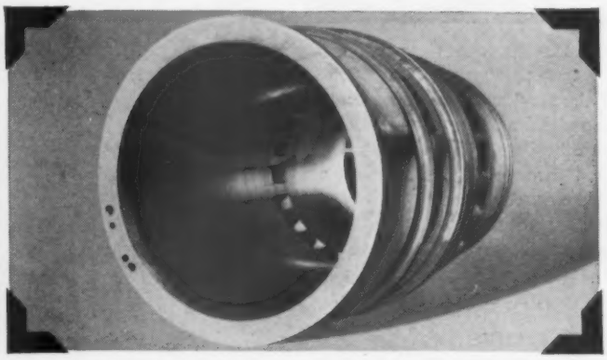
LOCATION Transcontinental freight service on Moffat tunnel + Royal Gorge Routes

PERIOD In excess of 8 years

FIRM Denver + Rio Grande Western R.R.Co.

One million miles of service on cylinder liners and pistons





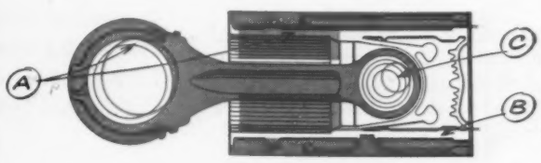
IN SERVICE APPROXIMATELY 1,000,000 MILES in Denver & Rio Grande Western Railroad diesel locomotive engines, this piston and cylinder liner were always lubricated with RPM DELO Oil R.R. At the end of that time wear measurements (inches) were only: Piston Skirt—0.001; Ring Grooves—No. 1—0.003 to 0.006, No. 2—0.002, No. 3 & 4—none; Cylinder liner (maximum diameter)—0.0095, (out of round)—0.002 to 0.004.

RPM DELO Oil R.R. has been the standard on the Denver & Rio Grande Western Railroad for over-the-road freight and passenger locomotives since their first power of this type was placed in service in January 1942. At the time this inspection was made approximately 49,563,104 miles had been traversed by the Rio Grande freight diesel fleet of 100 units and during that period only 77 cylinder liners had been scrapped for any reason. At that time many of the original pistons and cylinder liners were still in service and the average age of all these assemblies, including recently purchased power, was 4.7 years.

RPM DELO LUBRICATING OILS

TRADEMARK "RPM" REG. U.S. PAT. OFF.

How RPM DELO Oil R. R. prevents wear, corrosion, oxidation



A. Special additive provides metal-adhesion qualities...keeps oil on parts whether hot or cold, running or idle.

B. Anti-oxidant resists deterioration of oil and formation of lacquer...prevents ring-sticking. Detergent keeps parts clean... helps prevent scuffing of cylinder walls.

C. Special compounds stop corrosion of any bushings or bearing metals and foaming in crankcase.

FOR MORE INFORMATION about this or other petroleum products of any kind, or the name of your nearest distributor handling them, write or call any of the companies listed below.

STANDARD OIL COMPANY OF CALIFORNIA
225 Bush Street • San Francisco 20, California

THE CALIFORNIA COMPANY
P. O. Box 780 • Denver 1, Colorado

STANDARD OIL COMPANY OF TEXAS
P. O. Box 862 • El Paso, Texas

man, car draftsman and lead car draftsman with the Chicago, Milwaukee, St. Paul & Pacific from 1926 to 1936, and was engineer of passenger car design for the Union Pacific until 1943. Subsequently, he was associated with the Railway division of Reynolds Metals Company as assistant mechanical engineer, mechanical engineer and chief engineer. Mr. Borucki became chief mechanical engineer of Transportation Specialties in April, 1948.

◆

H. K. PORTER COMPANY.—The *Quaker Rubber Corporation,* division of the H. K. Porter Company, has opened a stock-carrying branch warehouse and sales office at 872 W. Milwaukee avenue, Detroit. *J. R. Alexander,* formerly Cleveland district manager, has been appointed district manager of the new branch, which will serve all of Michigan.

L. L. Garber

Lawrence L. Garber, general manager of the *American-Fort Pitt Spring division* of the H. K. Porter Company, has been elected a vice-president of the company.

◆

AMERICAN BRAKE SHOE COMPANY. — *Raymond H. Schaefer* has been elected a vice-president of the American Brake Shoe Company, with headquarters at Mahwah, N. J., as announced in the June issue of *Railway Mechanical & Electrical Engineer.*

Mr. Schaefer joined Brake Shoe in 1940 as assistant foundry metallurgist of the American Manganese steel division, and was later successively foundry metallurgist and general foundry superintendent. In 1943 he was appointed assistant chief metallurgist of the parent company and, in 1945, chief metallurgist. He was appointed director of research and development in 1947. He will continue in charge of the research activities of the company.

◆

MACLEAN-FOGG LOCK NUT COMPANY. —has announced the appointment of *Robert H. Waite,* formerly with the American Car & Foundry Co. in Chicago and New York, has become associated with the MacLean-Fogg Lock Nut sales department in Chicago.

◆

AIR REDUCTION COMPANY.—*S. D. Baumer* has been appointed vice-president of the equipment manufacturing division of the Air Reduction Company. *E. H. Roper,* formerly assistant manager of the general technical sales department of Air Reduction

GOULD

Plus-Performance Plan

. . . VOLTAGE REGULATOR SETTINGS IMPORTANT

FOR LONGEST BATTERY SERVICE!

Right now, the problem of conserving and extending essential battery power is urgent. Timely help is offered you by the GOULD PLUS-PERFORMANCE PLAN which can improve battery performance as much as 50%! Here is a complete system of manuals, articles, specifications, bulletins, record cards and charts which explains and illustrates how to select, charge and handle, maintain and determine the condition of your car lighting and air conditioning batteries.

The material comprising the GOULD PLUS-PERFORMANCE PLAN is available to battery users without obligation. A request on your letterhead will bring descriptive literature by return mail.

Systematic testing with hydrometer gives accurate check on regulator setting.

Gould "Z" Plate Batteries—America's Finest Car Lighting and Air Conditioning Batteries

HOW TO SET VOLTAGE REGULATOR CORRECTLY

Recommended settings as starting points for various sized car lighting and air conditioning batteries are as follows: 37 volts for 16 cells; 75 volts for 32 cells. Check regulator setting either by specific gravity readings, amount of water added, or both. Excessive water consumption is a sign of too high a voltage regulator setting and setting should be reduced. Dropping off of specific gravity is sign of too low a voltage regulator setting and setting should be raised. It is suggested that settings be changed in steps of ½ volt each. Ideal regulator setting is one that keeps specific gravity at fully charged value with a minimum of water loss.

GOULD STORAGE BATTERIES

GOULD-NATIONAL BATTERIES, INC., TRENTON 7, NEW JERSEY

Always Use Gould-National Automobile and Truck Batteries

Sales Company, a division of Air Reduction Company, has been appointed manager of the department.

Mr. Baumer joined the Airco general technical sales department in 1941 as a steel mill specialist and was appointed assistant manager of that department in 1944 and manager in 1948.

◆

JOSEPH T. RYERSON & SON.—*John R. Fennie*, a member of the sales staff of the Los Angeles, Cal., plant of Joseph T. Ryerson & Son since 1946, has been appointed manager of the tubular products department.

◆

AMERICAN HOIST & DERRICK CO.—*Robert J. Stoddard*, chief engineer of the American Hoist & Derrick Co., St. Paul, Minn., since 1947, has been appointed vice-president of engineering.

◆

GEORGIA-PACIFIC PLYWOOD COMPANY.—The Georgia-Pacfic Plywood & Lumber Co. has shortened its name to Georgia-Pacific Plywood Company. The company has opened a new warehouse in Pittsburgh, Pa., at 33rd street and Liberty avenue.

◆

SUNROC REFRIGERATION COMPANY.—*J. G. Crost* has been appointed executive vice-president of the Sunroc Refrigeration Company, Glen Riddle, Pa., for which company he has been acting in a consulting capacity.

GENERAL ELECTRIC COMPANY.—*Raymond C. Freeman* has been appointed manager of General Electric's Welding Divisions at Fitchburg, Mass., and *Alanson U. Welch* succeeds Mr. Freeman as manager of engineering of the Welding Divisions.

PERSONAL MENTION

General

Sidney Withington

SIDNEY WITHINGTON, engineering assistant in the operating department of the NEW YORK, NEW HAVEN & HARTFORD at New Haven, Conn., will retire on August 1, after 41 years of service with that road. Mr. Withington served as chief electrical engineer of the New Haven from June 1946 until December 1948, when he became engineering assistant. He was born at Boston on June 7, 1884, and received his M.E. degree in 1907 from Harvard Engineering School. He entered railroad service in 1910 with the New Haven and served successively as chainman, draftsman, inspector, general foreman, assistant engineer, electrical engineer, chief electrical engineer and engineering assistant. Mr. Withington was chairman (1929-1932) of the Committee on Electricity of the American Railway Engineering Association; chairman (1929-1931) of the Electrical Section and second vice-chairman of Division IV, Engineering, of the Association of American Railroads; chairman (1920-1924) of the Committee on Heavy Electric Traction of the American Electric Railway Association; and chairman (1930) of the Connecticut section of the American Institute of Electrical Engineers.

CHESTER K. JAMES, assistant superintendent of motive power of the Erie, has been appointed superintendent of motive power, with headquarters as before at Cleveland. Mr. James was born at Huntington, Ind., on October 16, 1901, and joined the Erie in 1924 following his graduation as mechanical engineer from Cornell University. He served successively, as special apprentice at Meadville, leading machinist, backshop foreman, enginehouse foreman, motor equipment inspector and master mechanic. He was appointed district master mechanic at Meadville in 1944 and assistant superintendent of motive power at Cleveland in 1946.

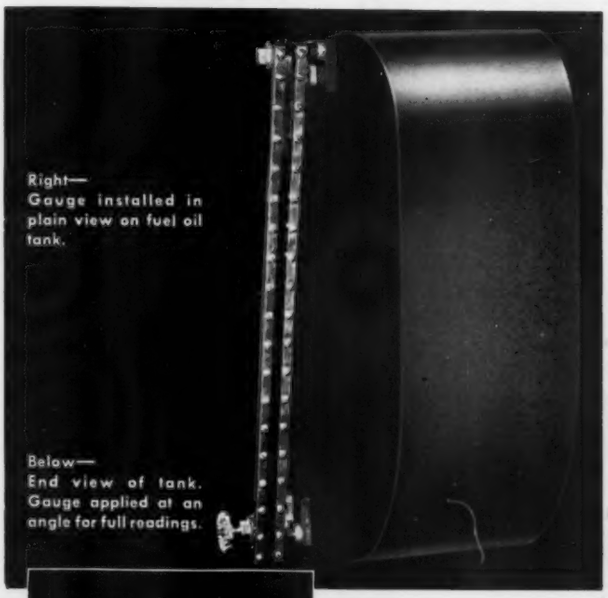
Chester K. James

WILLIAM G. CARLSON, Eastern district master mechanic of the Erie at Jersey

Get Full Readings on Diesel Fuel Tanks

with this New

MAGNUS GAUGE



A top-to-bottom gauge, flexible — mountable at any angle, the new Magnus diesel fuel tank gauge gives accurate full readings at all times. With a rigid brass body, the Magnus gauge is substantially built to stay on the job longer . . . not to be disturbed by vibration.

It's easily installed—simply by welding top and bottom plates to tank and drilling two holes. The reflex glass gives you accurate readings at a glance. For quick clean-out, just unscrew top and bottom plugs. Automatic shut-off valve prevents fuel loss in case of breakage.

Write for further information.

MAGNUS BRASS MFG. CO.

Subsidiary of National Lead Co.

525 Reading Road **Cincinnati 2, Ohio**

EX-CELL-O Railroad Pins and Bushings For Diesel or Steam Equipment

More than 200 railroads and railroad equipment builders (both steam and Diesel) specify Ex-Cell-O pins and bushings. You'll see why when you get this colorful new catalog. Ex-Cell-O railroad pins and bushings are case-hardened for longer wear; finished to precision limits to maintain other parts in alignment and prevent "cocking" of equipment. Steam and Diesel equipment styles and sizes are given in the new Ex-Cell-O Bulletin No. 32381. Write Ex-Cell-O in Detroit for your copy today.

XLO

51-17

Railroad Division

EX-CELL-O CORPORATION

DETROIT 32, MICHIGAN

City, N. J., has been appointed assistant superintendent of motive power at Cleveland. The position of district master mechanic has now been abolished. Mr. Carlson joined the Erie in 1938 as a carpenter helper, following study in mechanical engineering at Purdue University and business administration at Allegheny College. From 1939 to 1943 he worked as an apprentice in the locomotive shops in Meadville and Susquehanna, Pa., when he became a machnist. From 1944 to 1946 Mr. Carlson was in military service. Following return to civilian life, he worked as general foreman of enginehouses at Dayton, Ohio, Buffalo, N. Y., and Hornell. He became master mechanic at Hornell in 1950 and Eastern district master mechanic on May 1.

R. C. TRINKER, general inspector of the New York Central system at New York has been appointed special assistant to manager, equipment, of the New York Central System at New York, with duties to be assigned.

O. L. HOPE, mechanical superintendent of the Southern district of the Missouri Pacific, will transfer his headquarters from St. Louis to Little Rock, Ark.

O. R. PENDY, master mechanic of the New York, Chicago & St. Louis at Conneaut, Ohio, has been appointed chief mechanical officer, with headquarters in Cleveland.

J. A. WETZEL, assistant master mechanic, lines Buffalo and east, at Syracuse, N. Y., has been appointed special assistant to manager, equipment, of the system at New York, with duties to be assigned.

W. R. SUGG, mechanical superintendent of the Western district of the Missouri Pacific, has transferred his headquarters from St. Louis to Kansas City.

JOHN E. KLOSS, supervisor of diesel and motor equipment of the New York, Chicago & St. Louis at Cleveland, has been appointed assistant to chief mechanical

Shop and Enginehouse

H. C. BRADLEY, foreman of the Norfolk & Western at Durham, N. C., has been appointed assistant enginehouse foreman at Shenandoah, Va.

JOHN W. FAVEL has been appointed assistant enginehouse foreman (night) of the Southern at Chattanooga, Tenn.

L. F. HAMILTON, assistant foreman in the machine shop of the Norfolk & Western at Roanoke, Va., has retired.

J. G. MOORE has been appointed assistant enginehouse foreman (day) of the Southern at Chattanooga, Tenn.

W. D. MARSTON has been appointed assistant foreman enginehouse (night) AGS, at Birmingham, Ala.

C. W. LEWEY, foreman of the Norfolk & Western at Iaeger, W. Va., has been appointed foreman at Lynchburg, Va.

(Continued on p. 130)

Master Mechanics and Road Foremen

RALPH J. HUGHES, assistant to chief mechanical officer of the New York, Chicago & St. Louis at Lakewood, Ohio, has been appointed master mechanic at Conneaut, Ohio.

JOSEPH W. WALSH has been appointed road foreman of engines of the New York Central, with headquarters at Kankakee, Ill.

J. L. BROSSARD, has been appointed assistant master mechanic of the Chicago, Milwaukee, St. Paul & Pacific at Minneapolis Minn.

FRANK N. FOSTER has been appointed assistant road foreman of engines of the Toronto, Hamilton & Buffalo at Hamilton, Ont.

GEORGE E. LUND, Western district master mechanic of the Erie at Meadville, Pa., has been appointed assistant to the superintendent of motive power at Cleveland. The positions of district master mechanic has been abolished.

Obituary

ERIC G. EKLUND, general superintendent and superintendent of motive power of the Rutland at Rutland, Vt., died on June 22. Mr. Eklund was born in Sweden on September 17, 1888, and entered railroad service in 1905 as a machinist apprentice with the Boston & Maine. He subsequently served as machinist on various suothern and western roads until 1911, when he returned to the B&M, as enginehouse and shop foreman. Mr. Eklund became general foreman on the Rutland in 1923. In 1935 he was appointed superintendent motive power and rolling stock and in February of this year became also general superintendent of all operating matters.

THOMAS C. SHORTT, chief mechanical officer of the New York, Chicago & St. Louis, at Cleveland, died at his desk on June 22. Mr. Shortt was born at Crewe, Va., on December 9, 1888, and entered railroad service in April 1906 with the Norfolk & Western at Crewe as apprentice and machinist. He subsequently served with the Atlantic Coast Line, the Norfolk Southern, and the Seaboard Air Line. Mr. Shortt joined the Chesapeake & Ohio in November 1923 as machinist and extra foreman, later serving as enginehouse foreman, erecting shop foreman, chief inspector new equipment and supervisor reclamation. In October 1932 he became equipment inspector of the C.&O., the Nickel Plate and the Pere Marquette at Cleveland. He was appointed assistant to superintendent motive power of the Nickel Plate in July 1933; master mechanic at Conneaut, Ohio, in December 1937; superintendent motive power of the Nickel Plate at Cleveland in June 1942, and chief mechanical officer on May 1, 1943.

Thomas C. Shortt

WILLIAM A. CARLSON, superintendent motive power of the ERIE at Cleveland, died on June 17 while playing golf at the Shaker Country Club. Mr. Carlson was born at Chicago on April 27, 1890, and entered railroad service in June 1906 as a machinist helper with the New York, Chicago & St. Louis at Stony Island, Ill. subsequently serving as machinist apprentice, machinist, enginehouse machinist, assistant enginehouse foreman and general foreman. In May 1928 he became general master mechanic of the Erie at Hornell, N. Y., and in 1929 district master mechanic at Meadville, Pa. He was appointed assistant superintendent motive power at Cleveland on October 1, 1943, and superintendent motive power on January 16, 1946.

LITERATURE and PAMPHLETS Offered by Advertisers in *Railway Mechanical and Electrical Engineer*

Following is a compilation of literature, pamphlets and data sheets offered *free-of-charge* by advertisers in this issue of *Railway Mechanical and Electrical Engineer*. To receive the additional literature desired, merely circle the item number or numbers on the card below.

271. Diesel lubricants
Standard Oil Company of California. Information on RPM Delo Oil R.R. or other petroleum products of any kind. *Please specify.*

272. Megohmer Insulation Tester
Herman H. Sticht Co., Inc. Bulletins 455 and 1248 give data on the triple range long scale standard megohmer insulation tester.

273. Generator Drive
Spicer Manufacturing Div. Dana Corporation. Literature gives complete details of the Spicer Railway Generator Drive.

274. Whistling Fuel Tank "Fill" Signal
Scully Signal Company. Illustrated folder describes the Ventalarm signal installation and operation of diesel locomotives.

275. Lubricators
Miller Felpax Corporation. Full particulars about Modern Felpax Lubricators—for lubrication on diesel traction motor suspension bearings.

276. Silastic Tape
Dow Corning Corporation. Data available on the Dow Silastic Tape, Type R, insulation for traction motor field coils.

277. Heavy Duty Machine Tools
Consolidated Machine Tool Corp. Details on any of the many Consolidated heavy duty railroad machine tools available. *Please specify.*

278. Cleaners
Dearborn Chemical Company. Complete information on the Dearborn line of cleaners.

279. Battery Cradle
Electric Storage Battery Div. Thomas A. Edison, Inc. Complete information and typical layouts furnished of the Edison roll-out battery cradle.

280. Storage Batteries
Gould-National Batteries, Inc. Descriptive literature on the Gould Plus-Performance Plan showing how to conserve and extend battery power. *Please request this booklet on your letterhead.*

281. Packings, Gaskets, Oil Seals
Garlock Packing Company. Folders available on leather, asbestos, flax or cotton packings, metal and asbestos gaskets, and Klozure Oil Seal Models 53 and 63. *Please specify.*

282. Triple Alloy Steels Containing Nickel
International Nickel Co. Inquiries are requested by International regarding the selection and uses of triple-alloy steels, containing nickel. *Please direct these inquiries direct on your letterhead.*

283. Insulating Varnish
Irvington Varnish & Insulator Co. Technical literature available on: Harvel 912-C electrical insulating varnish, and class "H" flexible insulation. *Please specify.*

284. Diesel Fuel Tank Gauge
Magnus Brass Mfg. Co. subs of National Lead Co. Information on the new Magnus Diesel Fuel Tank Gauge.

285. Railroad Pins and Bushings
Ex-Cell-O Corporation. Bulletin #32381 lists standard styles and sizes of Ex-Cell-O pins and bushings.

286. Radial Air Compressor
Worthington Pump & Machinery Corp. Bulletin H-620-B16H gives data on two-stage Worthington Radial Air Compressors.

287. Welding Positioner
Worthington Pump & Machinery Corp. Bulletins and additional information on the Worthington-Ransome Welding Positioner.

288. Hydraulic Jacks
The Duff-Norton Manufacturing Co. Bulletin AD-3R discusses the Hydraulic Jacks for inspecting and renewing journal brasses.

289. Iron Body Gate Valves
Walworth Company. Bulletin #106 gives complete information on the new Walworth Iron Body Gate Valves.

290. Insulation Products
Johns-Manville. Facts on any of these 5 J-M insulation products: Thermo-Wrap, Stonefelt, Asbestos Shingle, Transite Pipe, Flexstone. *Please specify.*

291. Met-L-Wood
Met-L-Wood Corporation. Full information on Met-L-Wood uses in new or rebuilt cars—for passenger car interiors.

292. Evaporative Condenser
The Safety Car Heating & Lighting Co., Inc. Drawing #850027 shows the mounting dimensions for the Safety Evaporative Condenser.

293. Emulsifiable Chemical Solvent
Oakite Products, Inc. Service Report #7382 gives details on the use of the Oakite Renovator, applied by either hand or spray.

(Continued first column reverse side)

Additional Product Information

This is a complete list of products mentioned in the advertisements in this issue. For more data on any product shown, circle the page number on the reply cards below, fill in and mail. *Note:* If the advertiser mentions more than one product, or if more than one ad appears on the page, *write* in the name of the product you are interested in.

(Continued second column reverse side)

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Railway Mechanical and Electrical Engineer

30 Church Street

Readers' Service Dept.

New York 7, N. Y.

RAILWAY MECHANICAL and ELECTRICAL ENGINEER — **August 1951**

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LITERATURE AND PAMPHLETS

294. Flexible Shaft Equipment
Franklin Railway Supply Co. Catalogs and bulletins on: wire brushes, abrasive and grinding attachments, buffing and rubbing attachments, rotary files and cutters, single & three-speed countershaft and 4-speed "Strandflex" gear types flexible shaft equipment. *Please specify.*

295. Rebuilding Service (Diesel Injection Equipt)
Adeco Products, Inc. Complete information available on Adeco's special department for rebuilding diesel injection equipment.

296. Rubber Hose & Rubber Products
Quaker Rubber Corp. div. of H. K. Porter Co., Inc. New Quaker general catalog gives information of the Quaker line of rubber products for railroads, including hose, transmission belts, conveyor belts, etc.

297. Journal Box Visualizer
Hyatt Bearings Div. General Motors Corp. This simple plastic journal box visualizer shows ease of maintenance of Hyatt journal boxes.

298. Blast Cleaning Machine
Pangborn Corporation. Full information supplied on the Pangborn blast cleaning machine —the AC-4.

299. Electrical Insulation Tester
James G. Biddle Co. A complete picture of the Biddle line of Megger Instruments in Bulletin 21-05-X; ground testers only in Bulletin 25-X "Grounding Electric Circuits Effectively" Buletin 25T2-X. *Please specify.*

300. Flame Cleaning
Oxweld Railroad Service Company. Complete information on flame-cleaning methods by Oxweld.

301. Diesel Engine Power Tools
B. K. Sweeney Mfg. Company. Information on the Sweeney line of "Powerench" Tools for diesel engine maintenance.

302. Grinding Machines
Cincinnati Grinders Inc. Catalog. No. G-607 gives complete data on the Cincinnati Filmatic 14" and 16" Plain Grinding Machines.

303. Solid Journal Bearings
Magnus Metal Corp. subs. of National Lead Co. Booklet "The Facts About AAA Solid Journal Bearings" gives several whys and wherefores on the use of solid bearings.

304. Drop Tables
Whiting Corporation. New book "Whiting Drop Table" clearly illustrates with 38 photos many types of Drop Table variations —small and large—steam and diesel.

305. Natural Graphite
Joseph Dixon Crucible Company. Technical report "Natural Graphite" describes Dixon Graphite. Also available, sample of Dixon 1924 Quick Drying Lubricant. *Please specify.*

Additional Product Information

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First Class Permit No. 153 (Sec. 34.9, PL&R.), New York, N. Y.

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30 Church Street

Readers' Service Dept. **New York 7, N. Y.**

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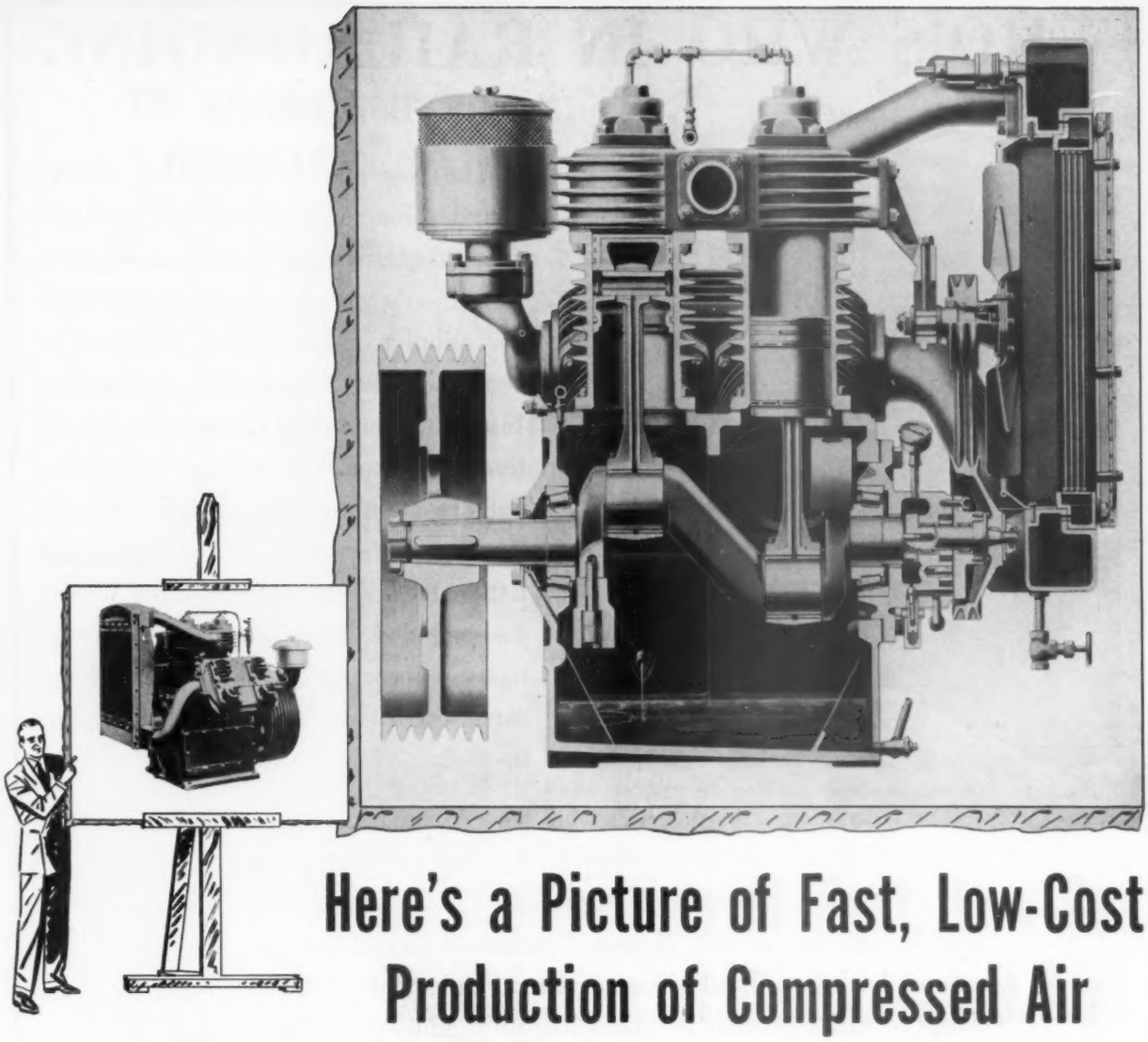


Here's a Picture of Fast, Low-Cost Production of Compressed Air

This air-cooled air compressor is ready for a hard day's work every day in the year . . . charging trains, general air service, etc.

It's a Worthington Radial with everything you want in an air compressor—air cooling, low maintenance cost, long life and these important features:

Airplane-type connecting rods—a Worthington exclusive. Fan-cooling of isolated cylinders—for cooler running and higher efficiency. Force-feed *filtered* lubrication to all pin bearings, saving 25-50% of lubrication costs and practically eliminating cylinder and bearing wear. Available in units of 25-100 hp with piston displacements from 142-538 cfm.

Want more reasons for selecting Worthington? No other air compressor can boast of all these features—fully counterbalanced crankshaft, ground and polished . . . Timken main bearings . . . and the famous Worthington Feather* Valve—lightest, tightest, most responsive valve ever made.

Write for Bulletin H-620-B16H on Worthington Radial Air Compressors—two-stage, 80-125 lb pressure. Worthington Pump and Machinery Corporation, Vertical Compressor Division, Holyoke, Mass.

*Reg. U. S. Pat. Off.

WORTHINGTON

N.1.1

NO OTHER AIR COMPRESSOR WILL OUTPERFORM A WORTHINGTON

A MESSAGE TO AMERICAN INDUSTRY

"This is more than a shortage . . . this is an emergency.

Every pound of your scrap is needed, NOW!"

"THE STEEL INDUSTRY is currently operating at more than 100% of rated capacity—turning out well over 2 million tons of steel per week. This record high production—every ton of which is in urgent demand—cannot be kept up unless we get more scrap from every potential source. For without your scrap we cannot produce enough steel. Today, every ton of steel turned out requires a half a ton of scrap for its production. That's why scrap—more scrap—is so urgently needed, and needed right away.

"The fact we have to face today is that steel mills are operating on a hand-to-mouth basis as far as scrap is concerned. Some mills are working on only a two-day supply of scrap. We already have had to shut down steel-making furnaces for lack of scrap.

"That's why we are asking you to strain every effort to get more scrap out of your plants and yards and on its way to the mills . . . to search out the scrap that doesn't come to market in normal times. You'll find this "dormant" scrap in obsolete equipment, tools and machinery that you haven't used for years . . . overlooked in your storage sheds . . . or rusting away in a junk pile in some forgotten corner. It's there. Turn it in at once—*so we can turn out the steel you need.* We can't do it without your help."

President, United States Steel Corporation

USS

UNITED STATES STEEL

Advertisers

IN THIS ISSUE

AMCCW Car Wheels save money for your railroad

coming *and* going

coming . . . When new car wheels are coming in, you'll find AMCCW wheels have the shortest haul, and consequently the quickest delivery. Chilled car wheel inventory can be kept to a minimum . . . and costly foreign line haul is usually eliminated.

going . . . You can ship worn wheels and other scrap conveniently to the nearby AMCCW plant, where it will be credited in exchange for new AMCCW wheels or bought at the going price.

coming and going . . . Chilled car wheels save money for your railroad by their low first cost, favorable exchange rates, easier shop handling; and by their high safety standards, plus the increased ton mileage they deliver.

NOW, more brackets—thicker, heavier, more continuous flange support; heavier tread on both rim and flange sides.

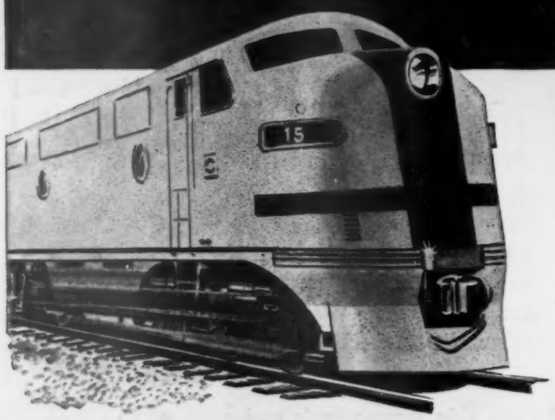
QUICK
TURN IN
of every available worn chilled wheel to your AMCCW plant means greater assurance of new wheels when you want them

AMCCW

ASSOCIATION OF MANUFACTURERS OF CHILLED CAR WHEELS

445 North Sacramento Boulevard, Chicago 12, Ill.

American Car & Foundry Co. • Southern Wheel (American Brake Shoe Co.)
Griffin Wheel Co. • Marshall Car Wheel & Foundry Co. • New York Car Wheel Co.
Pullman-Standard Car Mfg. Co.



Remember the "good old days" of the

WOOD-BURNING HIGHBALLERS?

Some valiant, venerable wood-burners still chug along, though most have long since gone to Highball heaven—ghost trains that haunt forgotten roundhouses.

Big Diesels hold the stage today. From the very beginning of Diesels, Dayton V-Belt Drives have been the overwhelming favorite. Dayton Endless V-Belt Drives are specified as original equipment on over 90% of all U. S.-built Diesels!

Dayton V-Belts do many jobs on a Diesel—drive the traction motors, blowers, exciters, auxiliary generators, radiator fans and compressors. And they consistently outdrive ordinary V-belts. A Diesel manufacturer's recent test of V-Belts subjected to overload showed Dayton Belts have a power loss of less than 1%, as against up to 5% for other makes.

Let the Dayton Field Engineer tell you more—why the lifeline of a Diesel is a Dayton V-Belt Drive! Stocks at Dayton, New York, Chicago, and Los Angeles. *Dayton Rubber Company, Railway Division, Dayton 1, Ohio.*

RAILROAD V-BELTS by Dayton Rubber

World's Largest Manufacturer of V-Belts

DAYTON RUBBER COMPANY • DAYTON 1, OHIO

Master Mechanics and Road Foremen

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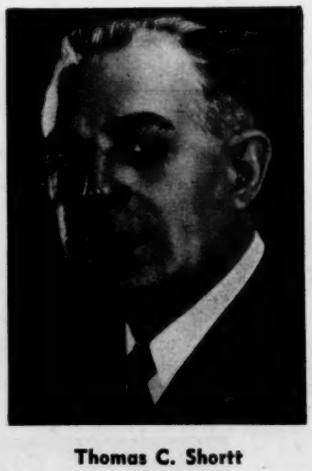

Thomas C. Shortt

WILLIAM A. CARLSON, superintendent motive power of the ERIE at Cleveland, died on June 17 while playing golf at the Shaker Country Club. Mr. Carlson was born at Chicago on April 27, 1890, and entered railroad service in June 1906 as a machinist helper with the New York, Chicago & St. Louis at Stony Island, Ill. subsequently serving as machinist apprentice, machinist, enginehouse machinist, assistant enginehouse foreman and general foreman. In May 1928 he became general master mechanic of the Erie at Hornell, N. Y., and in 1929 district master mechanic at Meadville, Pa. He was appointed assistant superintendent motive power at Cleveland on October 1, 1943, and superintendent motive power on January 16, 1946.